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*Annual Subscription Ten Dollars in Advance,
Single Copies One Dollar.*

PUBLISHED MONTHLY BY THE OPHTHALMIC PUBLISHING COMPANY,

7 West Madison Street, Chicago, Illinois.

Entered as Second Class Mail Matter at the Post Office, Chicago, Ill.

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AMERICAN JOURNAL OF OPHTHALMOLOGY

Vol. 1

JUNE, 1918

No. 6

CONTRACTION OF PARETIC EXTERNAL RECTUS MUSCLE DIMINISHED WHEN MASSETERS ARE CONTRACTED IN ACT OF BITING.

P. N. K. SCHWENK, M.D., F.A.C.S., AND WM. CAMPBELL POSEY, M.D., F.A.C.S

PHILADELPHIA, PA.

This is a clinical report of a case twenty years after severe injury involving the cranial nerves, followed by regenerative changes, with a study by Dr. W. W. Watson, of the probable anatomy of the nerve tracts involved, and comments by Prof. Wm. G. Spiller on its neurologic aspects, with 5 illustrations.

J. S., aet 34, came to the Wills Eye Hospital March 6, 1918, for the correction of an ocular deformity arising 20 years previously as the result of a severe head injury. The accident to which he ascribed his symptoms was occasioned by a fall while carrying a heavy gas drum, in consequence of which his head was caught between the drum and the wooden floor. He was sent to the Altoona Hospital and was unconscious for a week or ten days. Two months after the injury he was able to return to his former occupation.

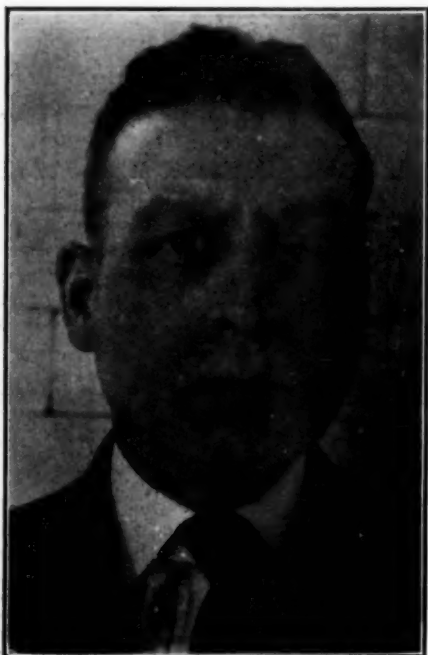
Immediately after the accident the patient noticed that the face was drawn to the right (left-sided paralysis), and that he could not chew with his teeth on the left side as well as he could on the right. The skin on the left side of the face was dead to the touch. He noticed some hardness of hearing, always aggravated by catching cold and occasionally had ringing in his left ear. Gradually the symmetry of his face was restored and the weakness observed in biting disappeared. Since the accident he has been employed at the same job and has been working regularly with only an occasional interruption for some minor illness.

The interest in the case from an ophthalmologic standpoint centers in the peculiar contraction of the left external

rectus muscle when the masseters are brought into play in the act of biting the teeth together. As may be noted in the accompanying illustrations, in primary fixation, the right eye fixes and the left is markedly convergent, i. e., about 45°. The lid of the affected eye droops, and this is due, not to a paresis of the levator, but, as Dr. Spiller has suggested, to a secondary contracture of the orbicularis, not unusual after paralysis of the facialis. In monocular fixation and in associated movements, it is only possible to rotate the left eye outwards and slightly beyond the median line, and the paresis of the left external rectus muscle seems complete. Synchronous, however, with a firm contraction of the masseters, the external rectus regains its power, contracts and rotates the eye outwards almost as though it had regained its normal stimulation.

We have all observed cases of associated movements between the eyelids and the eyeballs in conjunction with certain movements of the jaw, but all these were of congenital origin, and as far as I am aware, this case before us is unique in exhibiting this association as an acquired condition, apparently as the result of the head injury received years ago. Assuming that the phenomena could best be explained by

some peripheral union between the fifth and sixth nerves subsequent to the head injury, Dr. W. W. Watson kindly consulted anatomical authorities for us, and proffered the following explanation:



1. Looking straight ahead, showing drooping of left eye-lid and eye convergent.

First, that the muscles of mastication, viz., the masseter, buccinator, and temporal muscles are supplied by the anterior and smaller division of the inferior maxillary nerve.

That the inferior maxillary nerve is intimately connected with the otic ganglion (motor root).

That the otic ganglion through its sphenoidal filament communicates with the vidian nerve.

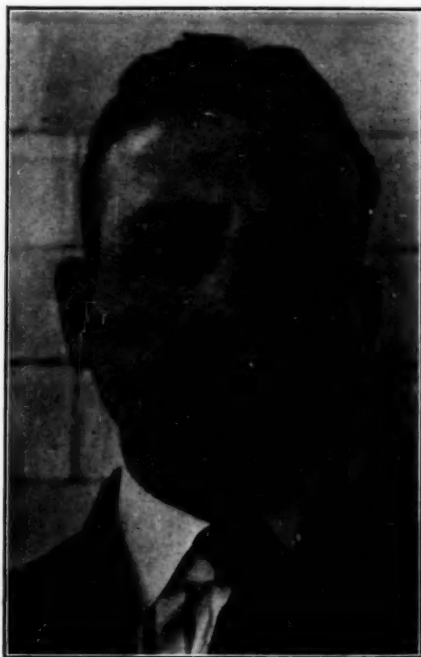
That the vidian nerve comprises the large superficial petrosal nerve (a motor branch of the facial nerve), and through this superficial petrosal the otic ganglion communicates with the sphenopalatine ganglion (motor).

That the sphenopalatine (Meckel's) ganglion sends an ascending branch to the cavernous sinus to communicate with the sixth nerve (Bock).

It seems possible, therefore to establish a communication by graphic plotting, from the inferior maxillary nerve through the otic ganglion, Meckel's ganglion, to the sixth nerve. See Fig. 5.

The case was submitted to Dr. W. G. Spiller, the well-known neurologist, for his opinion, and his letter is of such interest that we will quote it in full:

"In regard to your patient the following facts seem to me of importance: He received a severe head injury twenty years ago, following which he bled at the left ear, nose and mouth. He was unconscious for ten days, but was not paralyzed on either side of the body. The paralysis of the left external rectus occurred immediately after the injury; it was therefore not a congenital condition.



2. Looking straight ahead, with masseters acting; convergence of left eye not so marked as in Figure 1.

The left facial, the left acoustic, and the left trigeminal were paralyzed as well as the left abducens. The lesion probably was hemorrhage at the base of the brain. As the abducens is more

in the center of the base of the skull than the other nerves mentioned, it probably was most paralyzed by the hemorrhage. The trigeminal is at the side of the pons, passes over the petrous portion of the temporal bone, and therefore would be less affected in hemorrhage. It recovered its function more rapidly than the other affected nerves, and is the only one in which complete recovery has occurred. The lesion could not have been within the pons, because if it had been here it surely would have caused some weakness of the opposite side of the body, from implication of the pyramidal fibers, an intramedullary lesion could hardly have affected the four nerves mentioned without being a large one, as the trigeminal nerve is anterior to the other three, and so large a lesion

between the trigeminal and the ocular nerves the condition has been congenital, and the explanation of a double innervation, as for the trigeminal and the nucleus of the branch to the levator palpebræ, is satisfactory, but in the case we are considering the damage to the



3. Looking far to the left; right eye fixing, left markedly convergent.

would be likely to cause weakness at least, in the opposite side of the body. We must conclude therefore that the lesion was extra-medullary, and this conclusion is important."

"In the various forms of associated movements reported in the literature



4. Looking far to the left, with masseters acting. Convergence of left eye less marked than in Figure 2.

abducens was outside of the pons, and it is impossible to suppose that such a lesion almost completely destroyed the conduction of voluntary innervation and preserved that of associated movement. No explanation offered in the literature for the reported cases satisfies the demands of this case, the phenomenon must be dependent upon some arrangement peripheral to the lesion."

"It is common to find in peripheral facial palsy in which only partial recovery has occurred, contracture of the muscles about the mouth and spasmodic jerking of the lower part of the face about the mouth on the side of the palsy. If one observes carefully he will see that this spasmodic jerking is always in association with winking,

never occurs at a time when winking does not occur, and is an associated movement with the closure of the lids on the same side in winking. It is present only when there has been partial recovery, but the recovery must be incomplete. The explanation is that in regeneration some of the fibers from the central portion of the facial nerve intended for the upper branch lose their way and enter the lower branch, consequently the involuntary closure of

given by Dr. Watson, are in conformity with statements in books on anatomy, Gray's for example; but only in older editions of Gray's is the reference to Böck made. Meckel's ganglion sends fibers to the cavernous plexus. It also sends fibers through the sphenoidal fissure to the orbit, but it is not stated that the latter fibers communicate with the abducens. The abducens receives fibers from the cavernous plexus."

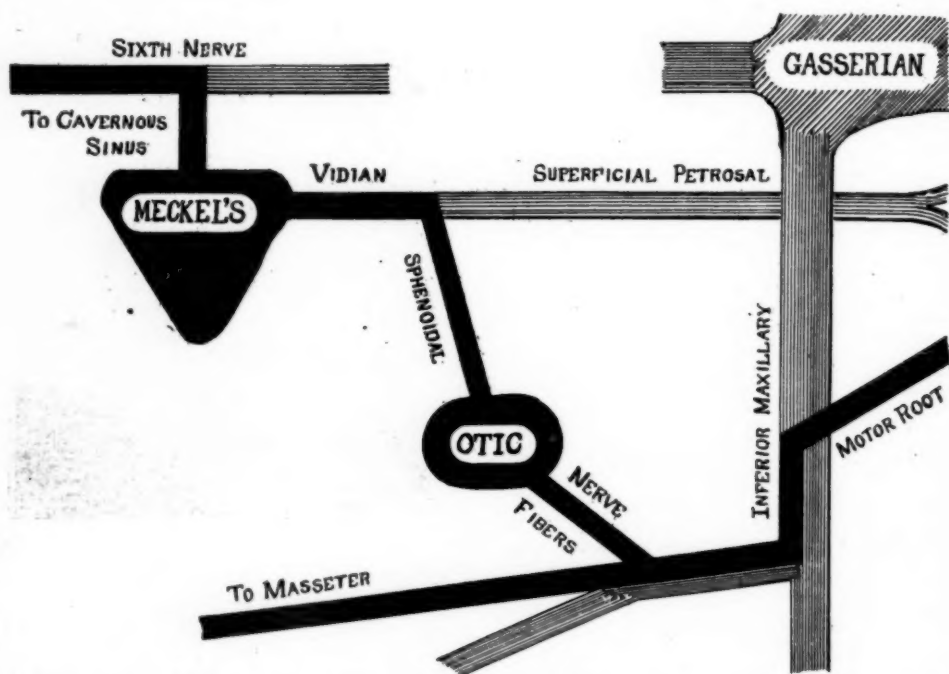


Fig. 5. Diagram of ganglia and nerve trunks to indicate association of contraction of abducens with contraction of masseter. The trunks and ganglia immediately in this motor tract are shown in black.

the lids through the action of the orbicularis palpebrarum sends some of the innervation to the lower branch with drawing up of the corner of the mouth."

"When the facial nerve is cut and an anastomosis is made between the peripheral end of the facial and the spinal accessory nerve, recovery results in associated movements. Attempt to move the face causes movement of the shoulder. This is another example of peripheral associated movement."

"The anatomic connections, as

"It is probable that the trigeminal nerve recovered fairly rapidly, before any regeneration occurred in the abducens. Some of the fibers from the third division may have wandered into Meckel's ganglion, and from here to the abducens. The route is circuitous, but it is largely in bony canals, and wandering nerve fibers of the trigeminal might take any course. As they approached the abducens they might have been attracted to it. The views of Ballance and Stewart are no longer held in full by most investigators; but it is

probable that the neurilemma nuclei of the peripheral end of a degenerated nerve exert an influence on the young axis cylinders, growing from the central end. As probably no such axis cylinders were in the abducens nerve at the time of regeneration of the trigeminal nerve, the young axis cylinders of the trigeminal nerve if they approached the abducens nerve, probably would be attracted to it."

"When the man is looking as far as possible to the right at the time he bites, the left eye moves to the left but not so far as when he is trying to look to the left when he bites. The actual

excursion is much the same. When he is trying to look far to the left at the time he bites the pupil goes beyond the median line. This is against the theory of inhibition of the internal rectus at the time of biting. There are other objections to the theory of inhibition."

With a view to lessening the deformity occasioned by the squint, we purpose endeavoring to transfer some of the muscle activity from the superior and inferior rectus muscles by resecting some of the fibers of these muscles and transplanting them upon the external rectus muscle.

DEEP X-RAY THERAPY IN THE TREATMENT OF TUMORS OF THE HYPOPHYSIS.

CLARENCE LOEB, A. M., M. D.

CHICAGO, ILL.

A review of previously recorded cases, with report of a case greatly benefited by this treatment, and comparison with a case relieved by operative treatment. Read before the American Academy of Ophthalmology and Oto-Laryngology, at Pittsburgh, October 29th, 1917.

Hypophyseal tumors manifest themselves by symptoms which are referable either to pressure, such as visual disturbances, or to interference with the endocrinal secretion, such as acromegaly, or by symptoms of a more general character such as headaches, dizziness, etc., which may be due to either pressure or secretory disturbances, or perhaps both. It is unnecessary to go into the details of these symptoms, as they are well known to all of you. I will merely mention that the characteristic ocular symptom is a bitemporal hemianopsia, caused by pressure posteriorly on the decussating fibers of the optic nerves. This is accompanied by more or less loss of central visual acuity, which in advanced cases causes a variation in the typical appearance of the fields. It very frequently happens that the visual disturbances are the first to cause the patient to consult a physician, and therefore the oculist may be the man to point to the correct diagnosis. But the correct diagnosis is

after all not the point which interests the patient most. What he consults us for is to obtain relief from distressing symptoms, and the question which arises is, "what have we to offer him in the form of relief or, better still, cure?"

If the disease is a local manifestation of a constitutional condition, for example syphilis, we have of course the recognized specific therapy. If, however, our tests for these conditions prove negative, and if an X-ray picture shows an enlargement of the sella turcica, so that we may safely assume the presence of a neoplastic growth or possibly a cyst, medicines may alleviate or mask the symptoms but will not influence the course of the lesion. We must have recourse to some other form of treatment.

Naturally the question of surgical intervention presents itself. This may be in the form of a decompression, which is after all merely a palliative measure. Or an attempt may be made to directly attack and remove the tu-

mor. There are various methods of approaching the hypophysis, but the best is probably the route suggested by Dr. Joseph Beck, namely the antrum-ethmoid-sphenoid route. However, it is not my purpose to discuss the various surgical methods, which are difficult, and not devoid of danger, as the rather high mortality shows. Because a method of treatment is dangerous is no argument against its employment in a condition which itself is more dangerous to function and even life, unless some alternative can be suggested which will accomplish results as good with less untoward possibili-

site direction, until the use of the X-rays was practically abandoned.

Contributing to its neglect was the fact that general surgeons, such as Cushing, McArthur and Eiselberg, and especially otologists, such as McKernon, Newman and Beck, showed that the brain under proper precautions was as safe for operative procedures as other parts of the body, such as the abdomen and thorax, which careful asepsis and improved technic had added to the domain of successful surgery. If success had invariably attended their efforts, and if it were always possible to persuade the patient to submit to an oper-

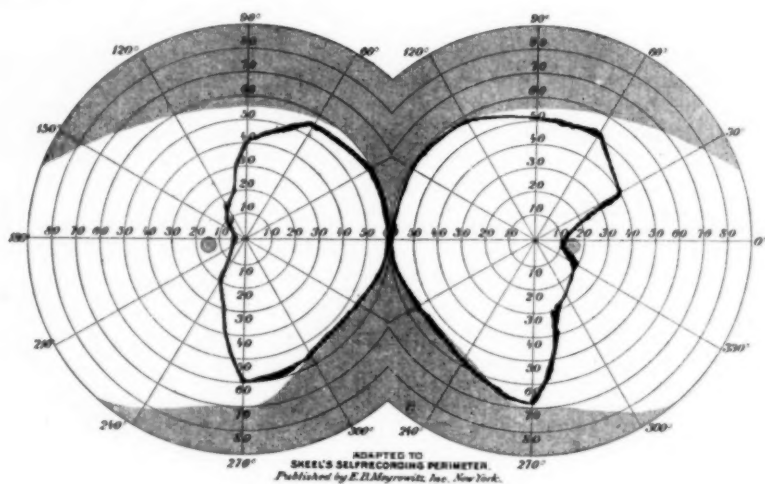


Fig. 1. Fields of vision Mrs. H., Aug. 8, 1917.

ties. Such an alternative I wish to present to you today by detailing the course of a case of hypophyseal tumor treated by deep X-ray therapy, which has been under my observation recently at the North Chicago Hospital.

Radiotherapy of intracranial tumors is not especially new. In the furor which greeted the news of the discovery of the Roentgen rays, and their exploitation as a panacea, their use in intracranial conditions could not be overlooked, especially as cranial surgery was then in its infancy. The usual number of marvelous results was announced, but sober second thought and a more careful scrutiny of cases caused the pendulum to swing in the oppo-

sition, "finis" might have been written to this chapter of surgery. As it is, we must welcome the fact that there is a possibility of a recrudescence of X-ray therapy for intracranial tumors, and must investigate carefully its claims to a place in our armamentarium.

In 1909 Gramegna¹ reported a case of acromegaly treated by X-rays in which he obtained a temporary improvement in the visual fields accompanied by a complete disappearance of the headaches. In spite of treatment, however, the case went on to a fatal termination. In 1913, B  cl  re² reported four cases. The results of the treatment were as follows:

(a). Disappearance of headaches,

dizziness, nausea and vomiting. Distinct improvement in vision, including increase in the visual fields. Cessation of pathologic bony changes and restoration of the sexual function. The patient passed away from the direct observation of Bécélère, but the family physician reported that the patient was in good health five years after treatment.

(b). Improvement of visual fields, also central vision. However, some parts of the optic nerves had already undergone degeneration. The same after one year.

(c). Increase in the visual fields and central vision. Impotence less. The same after one year.

can be checked, but the organic lesions already established cannot be made to disappear. In the early stages of this form, X-ray therapy is indicated, but in the later, where the hyperfunction has given place to insufficiency of secretion, it is contraindicated.

Other men have used the X-ray in the treatment of hypophyseal tumors, and their results have been quite satisfactory.

Calamet³ treated a case of typical pituitary tumor with radiotherapy with only temporary improvement. The ultimate outcome of the case is not given.

Terrien⁴, however, reports a case of his own where the improvement has lasted four years. He also refers to a

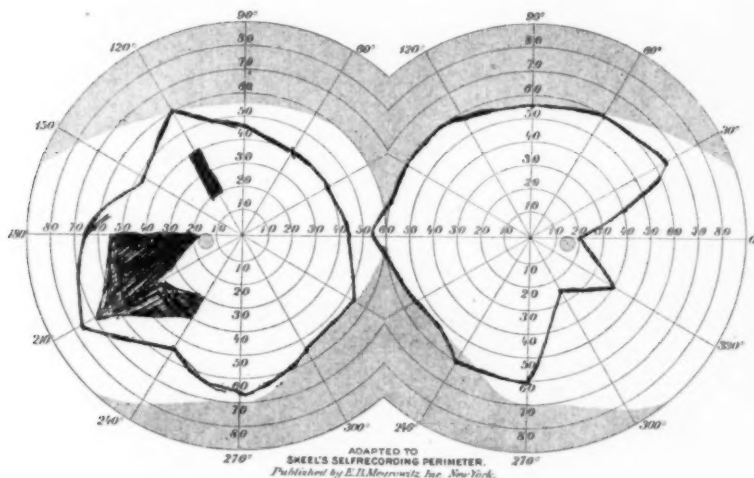


Fig. 2. Fields of vision, Aug. 22, 1917.

(d). Slight increase in visual fields and central vision, complete disappearance of headaches. Still under observation.

Bécélère's conclusions are that there are two classes of tumors from a symptomatic standpoint. First, those where the symptoms are due to compression, especially of the optic nerves. These cases are the most favorable for treatment, and the X-ray is useful in all stages, especially the early ones before atrophy of the nerves has developed. Second, those where the symptoms are especially manifest in the bony skeleton. In these, the abnormal growth

case of de Lapersonne when a distinct improvement took place in a case of acromegaly with disturbances in the visual field, headaches and enlargements of the sella turcica. Under radiotherapy these symptoms became very much ameliorated.

My own case is as follows:

Mrs. H., age 38, came complaining of headaches from which she had been suffering for 5 years. These varied in intensity but she was rarely free from them. In addition her sight had been getting bad for about the same length of time, and she had had many attacks of dizziness and nausea. When the

headaches first appeared, she had been examined for glasses on the theory that her headaches were ocular, but had been told that she did not need any. Since then she had not consulted a physician. For about the same length of time she had noticed that there was a change in her appearance, viz. that she had been getting fatter. Her face was larger, her hands were larger, and there had been an increase in the body fat. However, there had been no loss of hair on the body, nor any decrease in sexual instinct, although her menopause had set in about the same time, that is at the age of 32, just after the birth of

Nasal examination.—Large inferior turbinates on both sides, with hypertrophy of the whole mucous membrane. Very pronounced pyorrhea and calcareous deposits with diseased teeth. Lips large, tongue large. Highly reactive pharynx so that the pharyngeal structures can not be seen.

Examination of the eyes showed that the optic discs were paler than normal, but there was no actual atrophy. As the patient was illiterate and her mentality was somewhat low, either because of the disease or naturally, it was difficult to test her vision. However, it was determined to be $1/8$ in each eye.

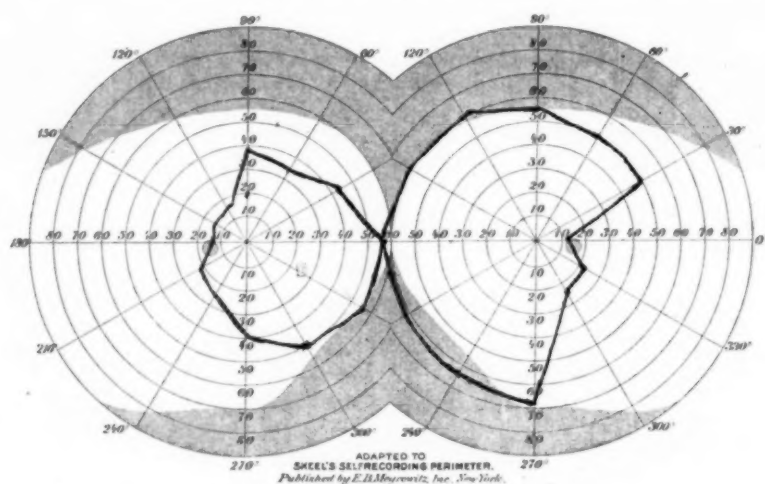


Fig. 3. Fields of vision, Sept. 19, 1917.

her youngest son. She had three children all alive and healthy, and her family history was negative. There had been no change in her voice. There was no increase in thirst. The test for sugar tolerance was defeated by the fact that the patient vomited when it was tried.

The physical examination of the patient showed the following: Height, 5 feet 4 inches; weight, 175 pounds. There is a general increase in the adipose tissue. The fingers taper. Thick lips and fat cheeks. Coarse features. Thyroid not palpable. All reflexes normal. Physical examination of heart and lungs negative. Blood pressure, maximum 110, minimum 80.

With a $+2$ sph. lens, the central vision was $6/20$ nearly. Taking of the visual fields was also difficult for the reasons mentioned above, and in addition because it was difficult to compel the patient to keep her eyes fixed on the central mark. However, it can be seen by the fields (see Fig. 1, page 398), that there is a distinct loss of the temporal fields, although not a complete loss. In addition there is some impairment of the nasal fields, especially the left. An X-ray picture of the patient's head indicated a decided increase in the area of the sella turcica as shown by the picture. A normal sella turcica is shown for comparison. Plate X.

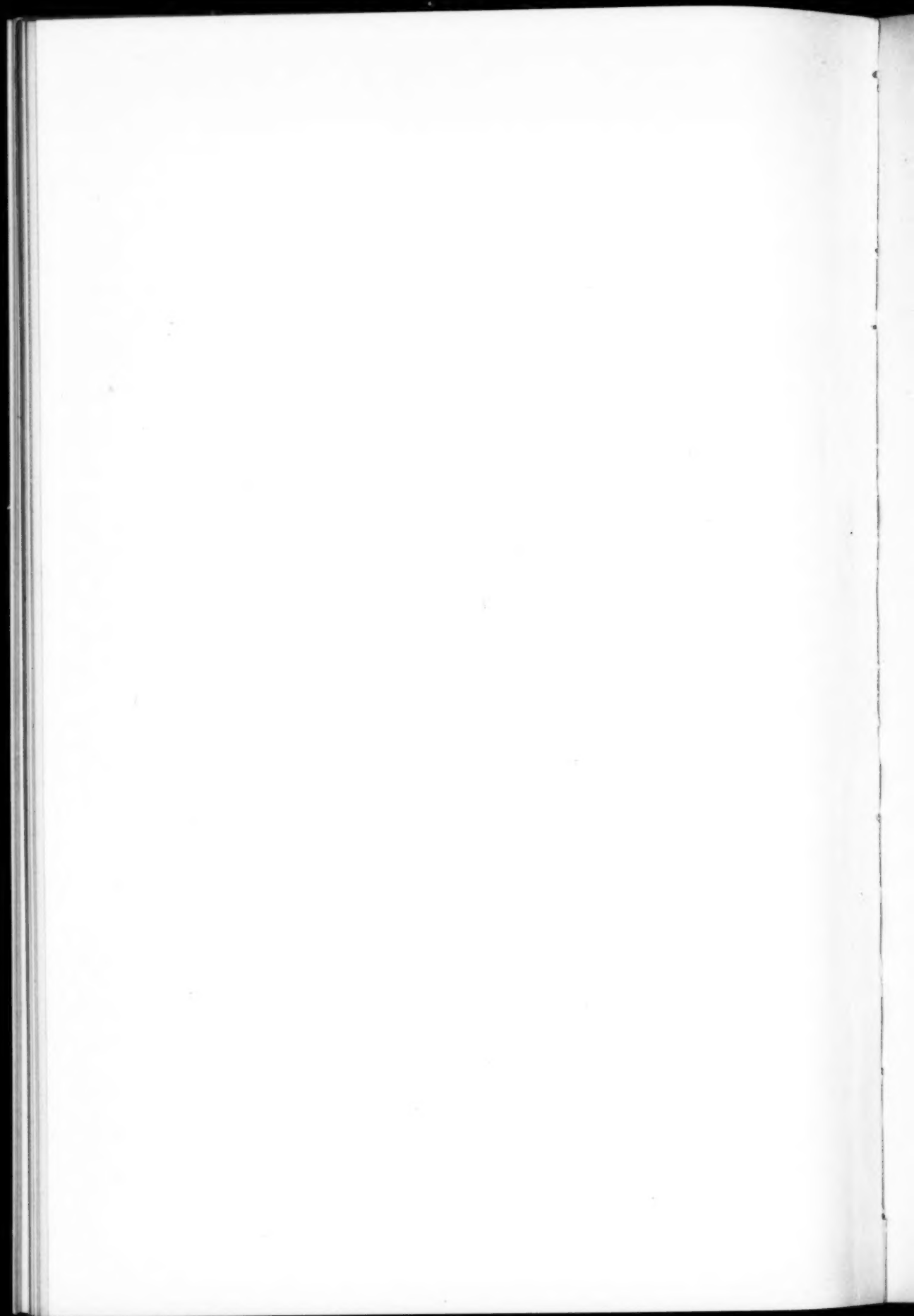
The patient was referred to Dr.



FIG. 4.—X-RAY PICTURE OF MRS. H. SHOWING DISTORTED SELLA TURCICA.



FIG. 5.—X-RAY PICTURE SHOWING NORMAL SELLA TURCICA.



Eisen, Roentgenologist of the North Chicago Hospital, who carried out the treatment as outlined below. From time to time the patient reported to me for examination. I have never been able to see any change in the disc. Almost from the beginning there was an alleviation of the patient's headaches. They did not disappear entirely, but there were intervals of complete relief, with an occasional headache of less severity. Also she was able to sleep, either because of relief from pain, or improvement in her general condition. A field of vision taken August 8th showed practically normal nasal fields, but practically no change in the tem-

downward and outwards, and a small one upwards and outwards.

On September 5, vision was 6/30+. As it was a dark day, taking of the visual fields was postponed to the following day, but the patient did not return until September 19. She had no treatment for a week, and stated that she felt much worse for the last five days. Her headaches had returned, and her sight had grown worse. The vision was only 1/6, and the visual fields were about the same as at the time of her first visit. On October 3, patient stated she still had occasional headache and some nausea, but her vision had increased to 1/4.

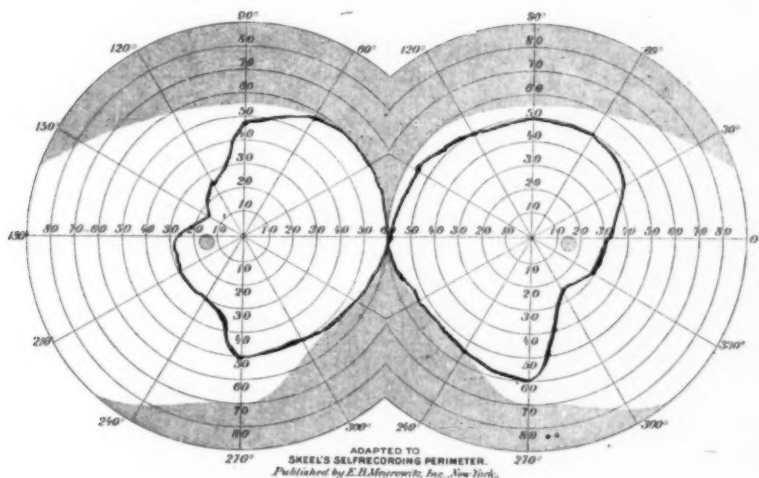


Fig. 6. Fields of vision, Oct. 17, 1917.

poral. Vision had increased to about 1/6 in each eye.

On August 22, the patient came to be examined in a very cheerful mood. She had been free from headaches for about two weeks except for a slight one the day before. Also she stated that she had been sleeping well, and that her sight was much better. The vision in each eye was 6/30. The visual fields showed an astonishing improvement. The right showed a normal nasal field with improvement upward and slightly downward. The left showed some loss in the nasal field, but temporal field of about 2/3 normal extent. However, there is a scotoma of considerable size

October 8. Patient feels better, no headache. October 17. General condition still improving. Vision = 1/4 in each eye. Visual field shows some improvement over the last time. Discs, unchanged. On the whole the improvement from an ocular standpoint has not kept pace with the improvement in headache and general feeling.

The treatment in this case is summarized as follows:

The places where the rays were applied were those closest to the hypophysis, i. e. over the right and left temple, right and left antrum, and nose. Between the tube and skin, an aluminum plate of one millimeter thickness

was interposed. The purpose of this was to cut out more of the "soft" rays, i. e. those of longer length, and concentrate the "hard" rays i. e. those of shorter wave length, which are less easily absorbed by the tissues overlying the hypophysis.

The applications were made until an erythema dose had been given, that is a dose sufficient to produce a slight redness of the skin. In the beginning this was given in four applications of five minutes each, in ten days to each area, covering the five mentioned areas in seven weeks. Lately the amount given is one-fifth less or

volts, $3\frac{1}{2}$ amperes in primary, with mercury interrupter of 1,800 revolutions per minute; the tubes, water cooled and measuring twenty-seven inches from anode to cathode, and twelve inches from cathode to automatic "Queen" reducer.

In contrast to this case, I should like to mention the result in a case of cyst of the hypophysis, which I recently saw. The symptoms date from the age of 13, some 23 years ago, and consist of visual disturbances, lack of ambition, heavy smoking and drinking, headaches; skeletal, skin, and adipose changes. Vision decreased to complete

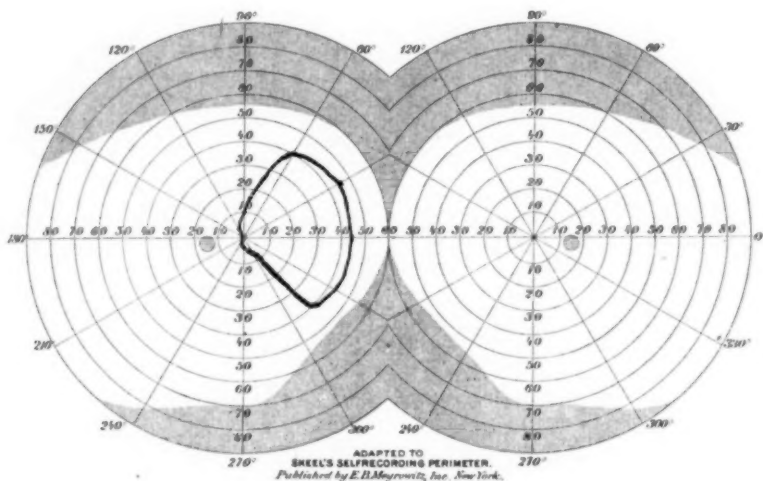


Fig. 7. Fields of vision in case of Dr. Jos. Beck before operation.

four minutes, reaching an erythema dose in two weeks, or ten weeks for all five areas. The reason for this reduction is a clinical one, namely the patient complained of nausea, dizziness, and prostration on the evening following the treatment. With the present amount these symptoms do not appear.

The skin-focus distance was eight inches. The equivalent spark gap of the tube varied from nine to fourteen inches, usually eleven inches. From $3/5$ milliamperes to $1\frac{4}{5}$ milliamperes were passed for four to six minutes, producing in each treatment three to seven milliampere-minutes. In all the patient has received 10 erythema doses. The generator is a 16-inch coil with 110

blindness in the right eye; with complete loss of the left temporal field, contracted left nasal field and great loss of central vision. Optic disc showed atrophy, and the X-ray picture showed enlargement of the sella turcica. An operation by Dr. Jos. Beck revealed the presence of a cyst of the hypophysis, which was opened and drained. Recovery was uneventful. Now, three years later, the patient presents himself with cure of headache, etc. The skeletal changes have persisted but have not increased. Disc pale. Vision: Right eye light perception, but inability to project. L. E. $1/10$, no increase with lenses. The visual field for the left eye showed almost complete loss

of the temporal field, but an increase in the nasal field to almost normal. The patient felt well, had good mentality, and on the whole was in a very satisfactory condition, considering how far the disease had progressed before the operation.

In conclusion, permit me to compare the relative merits of the surgical and X-ray treatments. Access to X-ray apparatus is as a rule easy, whereas operators able to attack the hypophysis region are not so very numerous. The patient, unless otherwise incapacitated is able to perform his daily occupation while under X-ray treatment. Patients

and this has been known to last for four years or more. Whether that means a cure can of course only be proven by a post-mortem. Decompression operations can do no better than that. Removal of the tumor may mean permanent cure, but this can always be held as a last resort in case the X-ray treatment fails. It seems to me that the logical course is first to try whether or not the X-ray treatment will prove of benefit. If the symptoms persist for a reasonable length of time, or if they become aggravated, then an operation becomes necessary, and this should be a direct attempt to remove the tumor

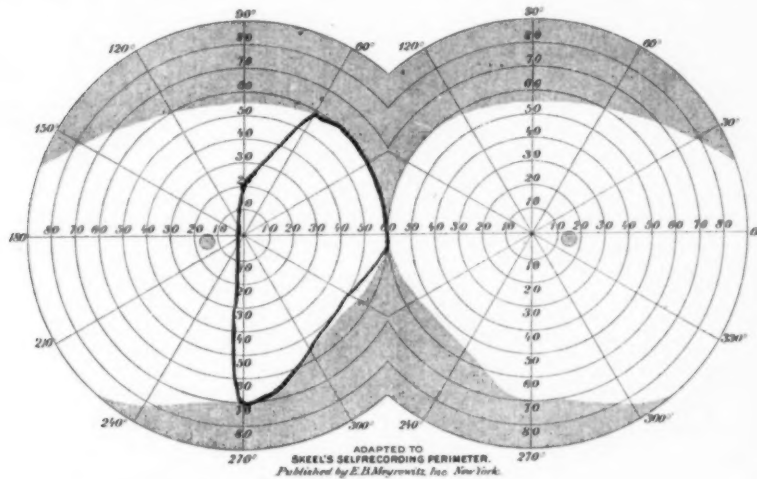


Fig. 8. Fields of vision in Dr. Beck's case 3 years after operation.

who refuse to undergo operation have in the X-ray a method of treatment which promises relief from symptoms,

if the patient is strong enough, otherwise a decompression followed later by extirpation of the tumor.

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VERNAL CONJUNCTIVITIS GREATLY IMPROVED BY RADIUM TREATMENT.

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Report of a case under observation five years, failure of previous treatment, cure by adequate applications of radium. Review of experiences of others with this treatment. Read before the Section on Ophthalmology of the College of Physicians of Philadelphia, January 17, 1918.

Reports of the successful treatment of vernal conjunctivitis by applications of radium have been made, from time to time, since the element was first introduced to the medical profession, about 15 years ago, and I believe additional facts are of considerable value, when they give promise of relief in this intractable condition, which at times resists all forms of treatment. So I desire to place the following case on record.

F. L., an undersized boy of eleven years, came to the eye dispensary of the University Hospital, in the service of Dr. G. E. de Schweinitz, in November, 1912, for treatment of his lids, to which the parents' attention had been called because of their thickness, and because the child continually rubbed them, especially in warm weather. Examination showed a very pronounced case of vernal conjunctivitis, of the palpebral type. The surfaces of the conjunctiva of both upper lids were almost completely covered by large flattened masses, with distinct pedicles, between and under which a probe could be passed. The growths were hard and fibrous, and showed the typical bluish-white film on their surface, and the lids were thick and heavy. The ocular conjunctiva had a milky appearance, but there was no thickening at the limbus. Various mild antiseptic solutions were employed, with but little effect, though the child was most comfortable when a solution of boric acid containing adrenalin was used. Some of the masses were excised, and the lids were once thoroughly rolled, but without effect.

In July, 1913, he was sent to the Oncologic Hospital, which had a supply of radium, and applications of radium were made by Dr. Wm. E. Newcomet.

Eleven treatments of an hour's duration each, were given to the right eyelid, the amount employed being 11 mg. Six applications were made daily from July 13 to July 18, the radium being enclosed in an aluminum capsule, with a 1/10 mm. lead screen, all covered by a rubber cot. Five more were given daily between August 7 and 12. No reactions occurred, but no effect was apparently produced, except that the eyelashes fell out. These subsequently grew again, but are still very long and stiff, and fewer in number than usual.

The child attended the dispensary regularly at the University Hospital, and in July, 1915, he came with an abrasion of the right cornea, from rubbing the eyelids. This was followed by an ulceration and a faint opacity, which is still evident. The growths at no time disappeared during the colder months, but a gradual change was noted, in that they seemed to coalesce into a smaller number of very large masses, some of which measured 6 to 8 mm. in diameter. In February, 1917, it was decided to have radium treatment tried again, because of the successful results which had been reported by Dr. F. W. Shine in New York, and the boy was sent to Dr. Henry K. Pancoast, at the University Hospital, who had control of larger quantities of radium. The applications were made as follows, and I am indebted to Dr. Pancoast for permission to use his records:

February 16, 1917. Application of 35 mg. in 1/2 mm. aluminum capsule, directly to the upper lid, left eye, for 15 minutes. On February 20, a note was made that the eye was sore; slight superficial sloughing was present. March 9, no reaction remains. Condition is somewhat improved.

March 9. Application of 50 mg. in 1/mm. aluminum capsule to right upper lid, 15 min.

March 20, 35 mg. to left upper lid, 15 min.

April 21, 35 mg. to each lid, 15 min.

May 15, 50 mg. to left upper lid, 15 min.

May 22, 35 mg. to right upper lid, 15 min.

June 25, 40 mg. to each upper lid, 15 min.

This ended the radium treatments, five having been made to the left and four to the right, in a period of four months. The amount varied between 35 and 50 mg. and the time of exposure was 15 minutes, at each sitting. In November, 1917, he reported at the eye dispensary, and the growths were found to have completely disappeared. Except for a superficial roughening of the conjunctiva, due to scar tissue, the patient can be said to be cured, though he will be carefully watched for a recurrence during the warm weather. It was the most elaborate case of its type that I have seen, and the result obtained has been very gratifying.

One of the earliest recorded cases of the use of radium in vernal conjunctivitis was by Mackenzie Davidson and Arnold Lawson,¹ in a boy 12 years of age. Treatments were started in Feb., 1906; seven applications were made during a period of eleven months. From 29 to 44 mg. of radium were employed for about 15 minutes each time. The cure was complete. They noted that the immediate results were nil, except for a little redness, and some increase of photophobia and lacrimation for a day or two. The papules however seemed to melt gradually away, without any obvious alteration in their contour or appearance, whilst so doing. The improvement in the lessening of the irritability of the eyes began to manifest itself within six weeks of the commencement of the treatment. There was no recurrence after a year. Their experience taught them to prefer a few sittings, with a large dose, to more frequent sittings with a weak dose; the length of the sitting would

not make up for the weakness of the dose.

In 1909 Shine² showed a case of spring catarrh which he had treated with radium, with a favorable result. Sixty mg. of radium were employed for a period of five minutes, and the treatment was repeated eight times during eight weeks. The conjunctiva became entirely smooth, and the patient was free from discomfort.

Schnaudigel³ in 1912 secured healing in a 16 year old girl by the use of radium in 10 mg. doses, applied for 25-30 minutes, in treatments which lasted over a period of 16 months. The patient had been treated for five years by other methods without improvement.

F. W. Shine⁴ showed another case before the Academy of Medicine in New York, October, 1916. Three applications of 20 mg. for 25-35 minutes, in intervals of two weeks, had caused disappearance of the growths on the lid treated, whereas the other lid remained the same. He said that he had treated four other cases with radium. Two were pronounced cured after two applications of 60 mg. for 15 minutes; one case required four applications to relieve it. All the cases had been followed, and were doing well; he had never noticed any irritation or inflammation of the cornea, after the radium applications, the precaution being taken to protect it, in each instance by a metal disc.

Harrison Butler⁵ reported two cases in 1917, one of which was treated with 45 mg. of radium bromide. Two applications of four minutes each, to the eyelids, were sufficient to completely cure the condition. The second case was treated with 7 mg. and five applications, of from 8 to 15 minutes were necessary, before a good result was obtained. One application was made to a plaque situated on each side of the upper limbus. The cure was not so prompt as in the first case when the quantity used was larger. He quotes Mackenzie Davidson, who has treated a number of cases with radium, as follows: "I can say that all the cases, without exception, which I have treated with radium, have been cured com-

pletely without leaving cicatrices; in some cases a certain degree of irritation has remained, though the characteristic aspect of spring catarrh has never reappeared, and I consider radium as the specific for spring catarrh."

Frank Allport⁶ of Chicago has reported a number of cases successfully treated with X-ray, but recently writes that he is now having one treated with radium by Dr. Pusey. No report of the result was made in the article.

In conclusion, therefore, I think we may say that radium may be considered a very valuable aid in curing these cases of vernal conjunctivitis, of the palpebral type, which have resisted other treatment, and the general experience has been that occasional applications of large doses—preferably 25-35 mg., for periods of 15 minutes, at intervals of two to four weeks are most efficacious, and that reactive inflamma-

tions may be prevented by suitable protection of the adjoining parts.

Since reporting the above case, three other patients have been placed under treatment with radium by Dr. Pancoast, at the University Hospital. All were refractory cases, which had been treated elsewhere for years, and showed very marked development of the disease in the upper eyelids. The results will be reported later. So far we have not treated any of the cases of the limbus type.

The method of application is to evert the upper lid by a pair of forceps, which are held to the forehead by an adhesive strip. The radium in a suitable clamp, is then applied to the exposed conjunctiva, and watched by a nurse, until the expiration of the time of exposure directed by the physician in charge.

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BLOCKING OF MACULAR ARTERIOLES AS A CAUSE OF CENTRAL AND PARACENTRAL SCOTOMA OF THE MACULAR BUNDLE TYPE.

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Report of two cases with discussion of this probable etiology and comparison of methods of taking the field of vision in such cases.

The classical picture of blocking of the central artery of the retina is familiar; the edema, giving the hazy white appearance to the retina; the cherry red spot at the macula; the almost complete disappearance of the arteries with the later appearance of "blood beads" in them; dilated pupil, if the good eye is covered; blindness, coming suddenly; all of these have attracted attention. The later aspects of the case are not so familiar and it is the appearance of the disc and the blood vessels which gives the clue to

what has happened and not the appearance of the retina, although there may be a faint cloudiness of this nerve tissue.

If a branch of the artery is affected, the signs and symptoms are much the same but limited in area. It is surprising to note how quickly the edema clears, how infrequently the "blood beads" come to notice; and after a month or two, how difficult it is to say what has happened unless one has followed the case from the early days. Hemorrhages sometimes occur, cer-

tainly in the branch obstructions. After a month, there may be no sign of trouble to the examining eye but a faint cloudiness and a few white dots, and perhaps, some changes in the contour

All authorities agree that once the inner layers of the retina are deprived of their blood supply for a time, they are destroyed as far as function is concerned and a scotoma is the result. The outer layers seem to derive their blood supply from the choroidal circulation and are not affected as a rule in this type of trouble.

The scotoma of the average block of a branch of the central artery is characteristically wedge shaped, as would be anticipated. But we are not especially interested in this form of trouble but in a centrally located defect, of very limited area but much more serious in its effects as far as vision is concerned because near the macula. These paracentral defects are undoubtedly noticed and called to our attention in most cases; but a peripheral vascular block of the same dimensions would most likely pass unnoticed. The fineness of the vessels about the disc is not the only reason to be considered in deciding the question of frequency.

The form of the defect and its location will, with the history, help to decide whether the scotoma is due to a nerve lesion or not; because in the absence of local signs, we must come to such conclusion, otherwise. The perimeter is an excellent instrument to get the outline of the fields but is not adapted to accurate outlining of central defects and in many cases, we miss them entirely. The recording field of the usual perimeter is compressed about twelve times and as the travel of

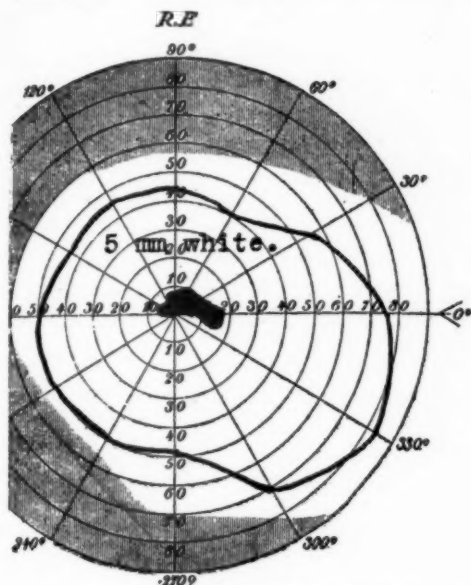


Fig. 1. Field of vision in blocking of macular arteriole (Lloyd's case) taken on perimeter with 5 mm. test object.

or appearance of the affected vessel, but if it be a small one there is very little to depend upon.

If one sees such a case late, after most of the resulting changes have already taken place, it is quite a difficult problem because the disc changes are absent and the alteration in a single small vessel will hardly be noticeable.

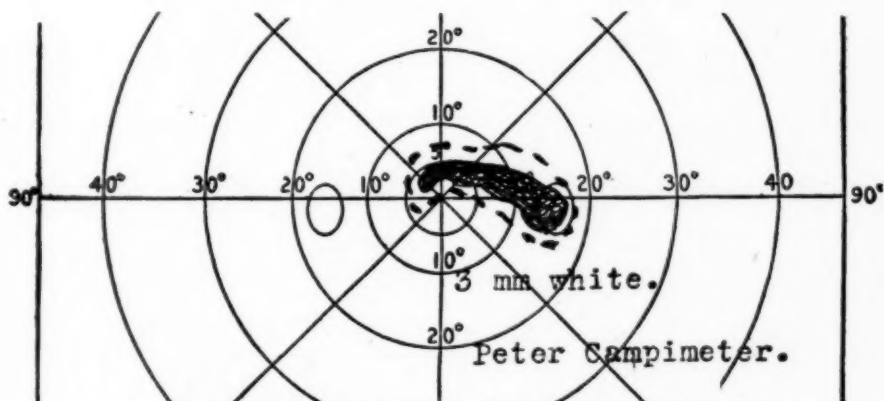


Fig. 2. The same field taken on Campimeter, with 3 mm. test object.

the test disc for ten degrees on the arc is actually about two inches, the space reserved for such recording is about 1/6th inch. A ten degree scotoma is certainly a fair sized defect. Early in these cases, the fixation point is involved and any monocular device will fail, lacking the certainty and accuracy of the binocular method.

The Haitz Charts are admirable but have too limited a field, covering only ten degrees each way from the fixation point. To get the blind spot (or disc area), the patient is supposed to look at the extreme side of the card but it has not been satisfactory. The Haitz

tient and examiner may be seated and the unavoidable motion which goes with the hand stereoscope is eliminated. The slate has been used on several cases of the type under discussion with results which the reader may judge of.

Mr. P. uses the microscope in his teaching and found one day that the eye usually employed did not give the customary results. His vision tested out for the right, the affected eye, 15/40 minus two letters and no improvement. The other eye was practically normal. The vitreous of the right eye contained a few moderately fine opacities but

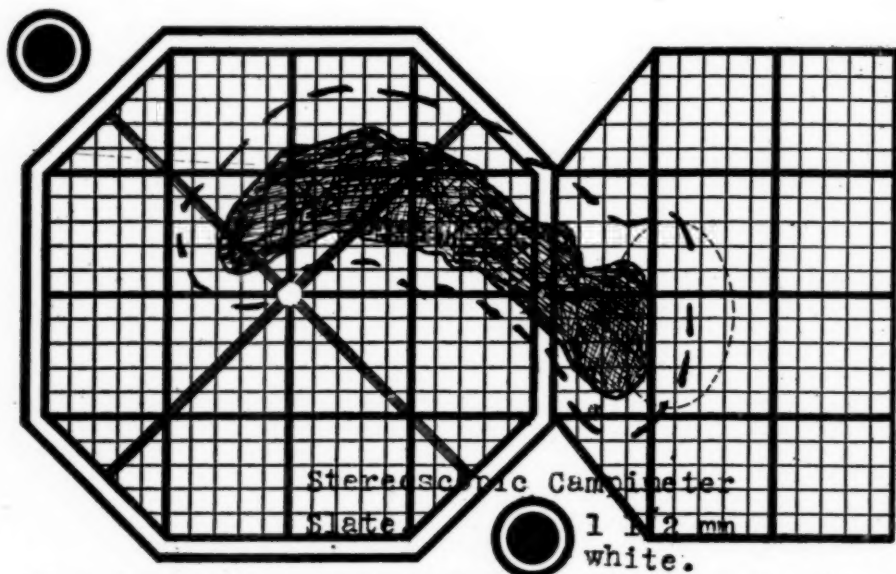


Fig. 3. The same field as 1 and 2 taken on Lloyd's Stereoscopic campimeter slate with 1 1/2 mm. test object.

Charts are made of paper and the examiner must count squares in order to locate on the record sheet, the various points which go to make up the outline of the defect. This consumes time at the expense of the patient's fixing power and the human eye is not habituated to remaining fixed upon one point long.

The Campimeter Slate avoids these defects and with the wide angle of view the necessary area is easily included without color aberration, which is so fatal to color testing. The stereoscope used rests upon the table and the pa-

there was none in the other. Direct ophthalmoscopy revealed a cloudy zone which ran in a graceful curve from the disc toward the macula, with the convexity downward, growing less noticeable as it approached the latter point where, to the examining eye, all was normal. Just short of the macula, there are a few white dots. The arteries of both eyes are of the silver wire type and the inner disc margins are "soft."

Sixteen months prior to this, the patient had cut his right leg, posteriorly, upon a broken bottle while bathing at

one of the city beaches. This was followed by a prolonged and profuse suppuration, which healed, leaving a leg which is swollen from the knee down and pits on pressure. This leg has been baked and massaged a great deal to lessen the swelling and pain which results after standing for some time. He had also, a number of nasal polypi which were removed. The blur seemed to him to be above the object looked at and involving it, and the defect was mapped out on the slate and showed

now just outside of the "zone of doubt."

Three months later his vision is 15/15 minus a letter or two and there is nothing to be seen except two or three white dots and a very faint cloud near the disc. No doubt even these faint signs will soon disappear and as the artery blocked fades out or disappears in such a way that it will not attract attention, we will soon have nothing but the history and the character of the defect to guide an examiner who is not familiar with the case.

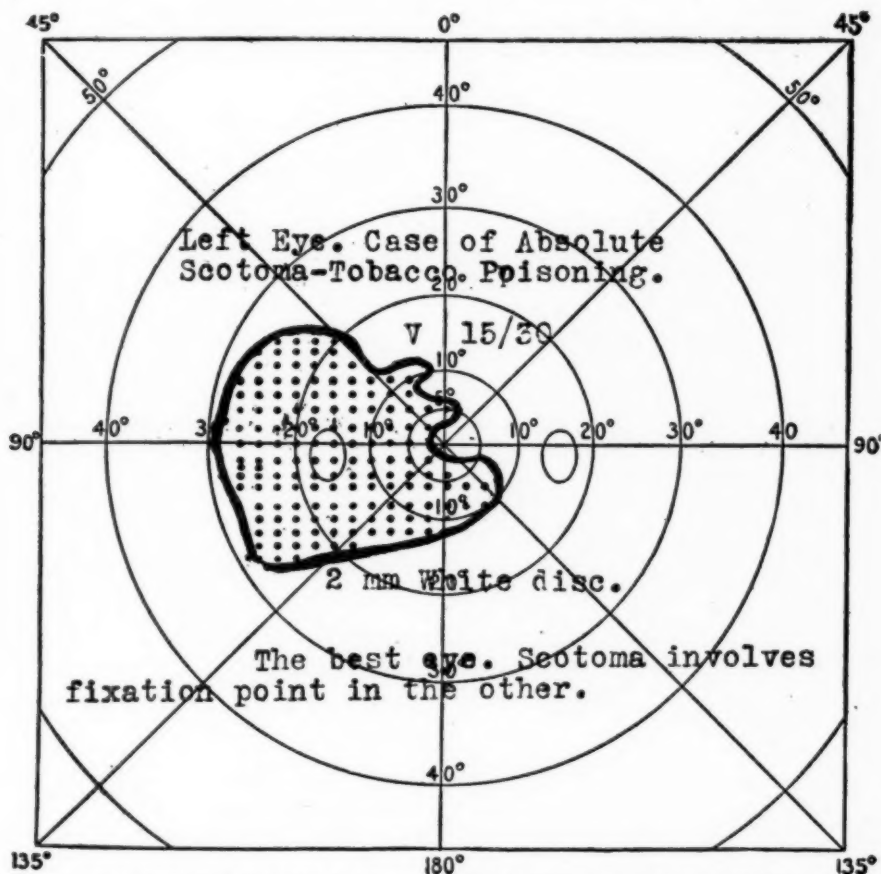


Fig. 4. Central scotoma for white in tobacco amblyopia taken on campimeter with 2 mm. disc.

the macular area included. Five weeks later, the cloudy area has decreased in size especially toward the macula and there are a few white spots remaining. His vision has improved to 15/20 minus four letters. The defect was again mapped out and the fixation point is

After the fixation point was free, the defect was outlined upon the perimeter, the Peter Campimeter and Campimeter Slate and these are submitted. (Figs. 1, 2 and 3.) If the slate record is reversed and turned upside down and looked at against a good light; the defect occu-

pies the exact position which the cloudy area originally occupied when viewed by direct ophthalmoscopy. This corresponds with the area supplied by the Inferior Macular Artery.

The macula is said to be without arteries, and that probably accounts for the shape of these defects as they avoid the fixation point after the edema has cleared.

The wavy outline is what one would expect if a slender vessel was occluded.

an enlarged blind spot and a small central scotoma, both relative, and for red, which merge, producing the classical oval defect including both fixation point and blind spot and becoming a defect for white, only if the patient continues his vicious habits. There is frequently a minute central absolute scotoma for colors and sometimes for white, but special means are necessary to demonstrate this.

In contrast with this, is the unilat-



Fig. 5. Field and scotoma for red in tobacco amblyopia taken on campimeter with 4 mm. disc for field; 2 mm. disc for blind spot.

The scotoma is absolute for white and colors. It is almost certain to be unilateral.

Tobacco and alcohol scotomas are bilateral and there has come to my attention only one case reported as unilateral and that was a recurrence. The tobacco and alcohol scotoma begins as

eral, absolute and suddenly appearing scotoma for white and colors, branching from the blind spot and curling about the macula. Choroidal and chorio-retinal defects need not be discussed here because there is evident to the examining eye an excellent reason for the poor vision.

Old tobacco and alcohol cases, which have gone on to the stage of a defect for white, do not give an outline like the vascular blocks of a slender vessel and are bilateral, although one eye is usually much better than the other. (See Fig. 4.) Old cases which have

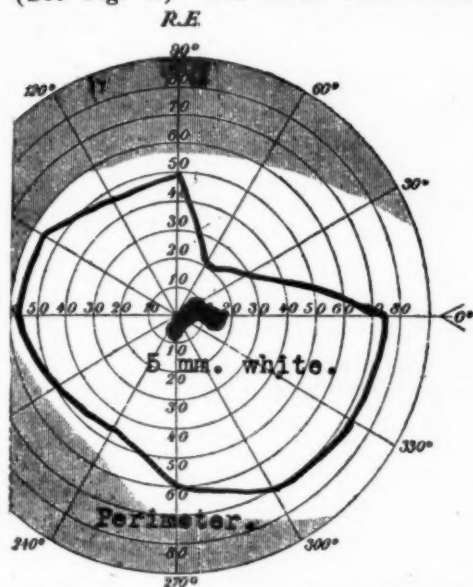


Fig. 6. Field of vision in old case of probable blocking of macular arteriole, taken with perimeter, with 5 mm. test object.

resumed their habits when half recovered have enlarged blind spots for red and perhaps a minute central scotoma, either for red or white. (See Fig. 5.)

Sphenoidal disease may be unilateral but the vision is early affected because the macular bundle is involved. This would be comparable to the early stage

of vascular block when there would be some evidences locally. The scotoma in sphenoidal disease begins with loss of red and green sense centrally. Every case of central scotoma or nerve disease should call for sinus examination.

The scotoma of glaucoma arching from the blind spot toward the fixation point does not in my humble opinion come on early. There is usually plenty of other evidence presented to the examining eye and the tonometer as well.

One other disease should always come to our minds when central vision is discussed and that is multiple sclerosis. The history of vision coming and going suddenly with obscure nerve signs, at first; with a central bilateral scotoma later; nystagmus, slurring speech and involvement of hands or lower extremities, should clear up the question. The field narrows and eye muscles are apt to be affected, but the pupil usually escapes. Hereditary optic nerve disease usually begins with a central scotoma for colors, red; is bilateral and after the field has narrowed, the patient is left with an island of useful retina external to the fixing area.

In contrast with the type of case presented previously, is another which comes seven years after the blur suddenly appeared. The patient complains of a blur before the right eye. With the left positively excluded, she can read nearly all the letters of the 15/15 line by turning the head and viewing the test chart from various angles and taking plenty of time. The other eye gives a 15/10 result. The macular

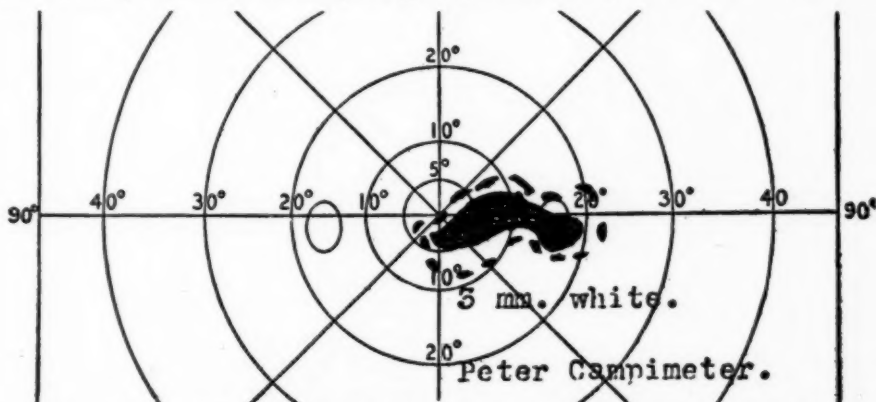


Fig. 7. Central portion of same field as Fig. 6 taken on campimeter with 3 mm. test object.

area of the affected eye is redder than the unaffected eye. The veins of both eyes have an occasional white strip along the border and when pressure is applied to the eyeball, the arteries jump.

The defect was outlined upon the slate and the typical result obtained. The record obtained on the perimeter

traits of these defects may be observed on this record as on the previous, and although a recognition of its type does not lead to restoration of vision, a correct diagnosis is certainly desirable. It would seem reasonable to say that to the usually accepted conditions which produce central or paracentral scotoma—toxic neuritis, sphenoidal disease, mul-

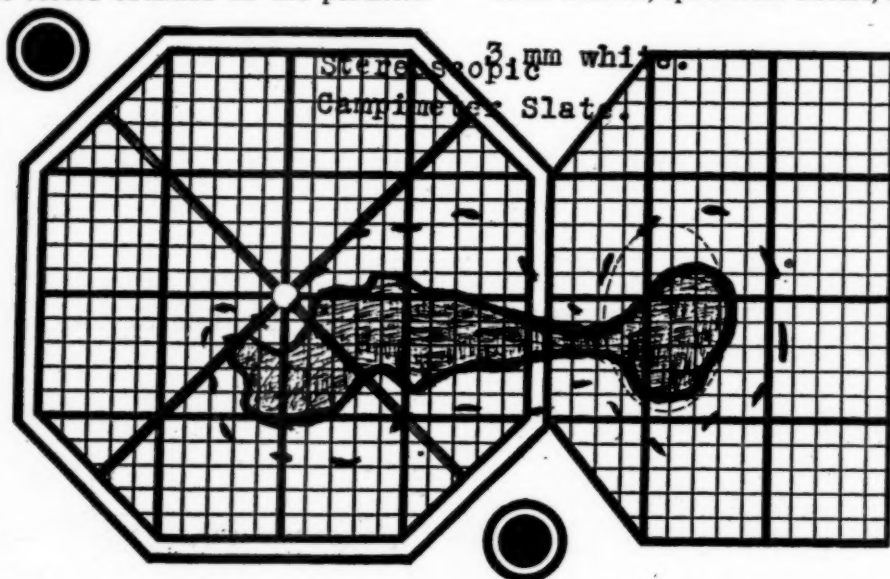


Fig. 8. Same field as Figs. 5 and 6 taken on Lloyd's campimeter slate with 3 mm. test object.

and the Peter Campimeter is also submitted. (Fig. 8.)

There is no minute central scotoma for white or colors obtained by the special Haitz Charts designed for testing this area, thus confirming the fact that the fixation point is fairly free. The

tiple sclerosis, hereditary neuritis, and glaucoma—conditions for the recognition of which we must exclude visible causes of a scotoma located near the macula or disc (except perhaps the glaucoma scotoma), we should add Blocked Macular Arterioles.

THE MAGNET EXTRACTION OF FOREIGN BODIES FROM THE EYEBALL.

FRANK ALLPORT, M. D., F. A. C. S.

CHICAGO, ILL.

A critical review of the subject based upon the following papers which appeared in the British Journal of Ophthalmology, January, 1917: 1. "The Removal of Foreign Bodies by Means of a Giant Magnet" by G. H. Pooley, F. R. C. S. of Sheffield. 2. "The Technique of the Haab and Small Magnets in the Extraction of Intraocular Foreign Bodies," by Maurice H. Whiting, Captain R. A. M. C., and Charles Goulden, Lieutenant, R. A. M. C. 3. "The Ring Magnet," by T. Harrison Butler, M. D., Leamington, England.

Concerning "The Ring Magnet," the writer has had no experience, and this statement is probably true of most sur-

geons in this country. The enormous attractive power of this magnet is unquestioned, but the exercise of such

power is seldom necessary, and can easily become dangerous in inexperienced or careless hands. This instrument is, however, so constructed that its force can be graduated, so that it may be as mild as an ordinary hand magnet. It is so swung that it can gently encircle the patient's head as he lies upon the table. Butler has devised some hand spatulas that he connects with the magnet and introduces into the eye, for the purpose of searching for, and withdrawing steel fragments. This procedure may be justified in operations performed through the cornea—where the steel is visible, and where accuracy of contact is possible. Its justifiability, however, in posterior chamber work, where the operation is done through the sclera, may be doubted, in spite of the writings of some authors. In such operations the steel is not visible and its exact location is not certain; neither have manipulations under ophthalmoscopic guidance proven successful. Under such circumstances, the uncertain and experimental introduction of instruments, such as points, spatulas, scissors, etc., into the vitreous chamber, not only may carry infection, but may also produce undesirable or destructive traumatic results. The writer is firmly convinced that magnet points of any nature should never be introduced into the vitreous chamber any further than the lips of the scleral opening. If a powerful magnet, such as a Ring, Haab or Victor, will not dislodge and deliver a steel fragment, by long patient contact with the scleral wound, and the violent and repeated switching on and off of the current, the writer believes it is better to desist and proceed no further. Under such circumstances the steel is either behind the scleral wall—where it will probably do no harm,—or so firmly embedded in the sclera as to be practically beyond magnetic power to remove, and may become covered with exudate and not extremely dangerous, or (if it is an old case) so completely tied down by exudative bands as to render its removal improbable and perhaps dangerous. Most cases de-

mand enucleation, if the steel is surely inside the eyeball and cannot be withdrawn by a magnet, but if the operator intends to try to save the eye, at all hazards, the writer believes it would be best *not* to introduce magnet points, inside the eyeball. The writer does not wish to be misunderstood. He believes that steel fragments should always be removed, where it is possible to do so without resorting to procedures that may be even more dangerous than to leave the steel in situ. He believes that intraocular manipulations in the vitreous chamber constitute such a menace, and while such procedures doubtless have produced good results, it is his opinion that they are too dangerous to be adopted as a recognized feature in difficult steel operations.

The warning of Butler, not to forget that there may be more than one fragment in the eye, should not be forgotten, although such instances are extremely rare. The writer remembers one case, where four small pieces were removed at one time. Such pieces are usually attracted to the magnet at the same time, and come out at the same time. It is the writer's belief that they enter the eye as one piece and break up into two or more pieces after they are inside the eyeball.

Whiting and Goulden, in their article, lay down the sensible rule that either corneal or scleral wounds, after they are healed, should be disregarded in the removal operation. The operator should then select the most advantageous point for the incision. If, however, the wound is still open, the avenue of entrance should be selected, even if it has to be somewhat enlarged. If the splinter has entered by way of the cornea, it has probably badly injured the iris and lens, and but little additional harm can be done in the unhealed case, by withdrawing it, through the unhealed avenue of entrance. This is not always true, however, for the writer has seen two cases where a minute speck of steel has passed through the cornea, iris and lens, without producing a cataract or other serious damage. These steel specks were removed by

the scleral route and excellent results obtained. Other surgeons have seen similar cases. This naturally brings up the important subject as to what method shall be adopted in the withdrawal of steel fragments from the interior of the eye, or to put it more bluntly, shall such fragments be removed through the cornea or through the sclera. Whiting and Goulden still adhere to the teachings of Haab, who has always advocated the corneal route in almost, if not quite all, cases. It seems to the writer that it is time to become emancipated from such arbitrary rules as enunciated by Haab. No one holds Haab in greater respect than the writer, but it seems to him a great mistake to insist upon drawing a foreign body from the vitreous chamber to the cornea, when it can be much more easily and (he believes) much more safely removed by an opening in the sclera. The writer advocates the following rules:

1st. In the recent injury, where wound healing has not yet occurred, the steel should be removed through the original opening, whether this is in the cornea or in the sclera.

2nd. When the wound has healed, and the steel is in the lens, or anterior to the lens, it should be removed through the cornea.

3rd. Where the wound has healed and the steel is in the vitreous chamber, it should be removed through the sclera.

Concerning the first of these rules, where the steel is withdrawn through the as yet unhealed avenue of entrance, the writer believes that this wound will usually have to be enlarged, as a steel particle will rarely come out of a hole of the same size as it went in. He believes that steel fragments usually fly with their long axis directed toward the eye and enter with such force as not to tear the cornea or sclera very much beyond the limits of their width. When they come out, however, they may emerge broadsides, or at all events, need a larger aperture than the wound of entrance.

If the steel entered by way of the cornea, the parts should be placed in as

good surgical condition as possible after the removal of the foreign body. Corneal and iris fragments should be smoothly cut away, and if traumatic cataract is present, as much of it as possible should be removed by gentle expression and irrigation. Exudates should be removed, either with forceps or by irrigation. If some collapse of the globe has occurred, the eye may be filled with warm sterile salt solution, as a substitute for the normal intraocular liquids. It must always be remembered, however, that cases of severe steel injuries, with large lacerations, iris prolapse, partially collapsed globes, etc., usually proceed promptly to develop panophthalmitis and terminate in enucleation. In the light of experience, the writer believes that eyeballs thus severely wounded are hardly worth a magnet operation, and are perhaps better enucleated at the start. Even if the globe is saved, it is usually unsightly, blind and dangerous, and it is a grave question whether an enucleation, a short illness and a speedy return to work is not, after all, the best course to pursue. Of course, the location and *extent* of the injury will play a conspicuous part in the advice given, as will also the hope that perhaps some sight may be saved, or at least that a presentable globe may be salvaged out of the disaster. Besides this—the patient and his friends will have to be consulted and the surgeon will be compelled to recognize that eyes, sightless or otherwise, are precious things and are not to be sacrificed, except as a last resort. If the, as yet unhealed wound, is in the sclera, the tear should be carefully cleaned of all tissue fragments after the steel has been removed. Salt solution may be injected to fill out a partially collapsed globe, after which the conjunctiva, but not the sclera, should be sutured. Whiting and Goulden advocate suturing the sclera, but the writer feels that this is a mistake because considerable force is necessary to suture the sclera, and besides this, when the sclera is sutured a thread is necessarily left inside the eyeball, which may not be aseptic, and certainly when it is removed, infection

may be drawn into the vitreous chamber.

As has been said, Whiting and Goulden strongly advocate the almost universal removal of steel through the cornea, according to the teachings of Haab, even when the steel is in the vitreous and the cornea is healed. The writer has already admitted the advisability of removing steel through the cornea when the fragment is in the lens, or anterior to the lens, but he believes that the scleral route should be chosen when such foreign bodies are in the vitreous chamber. Haab's procedure consists, briefly, in coaxing the splinter along the floor of the vitreous chamber through the suspensory ligament, into the posterior chamber, up the posterior wall of the iris, through the pupil, down to the floor of the anterior chamber and out through a corneal incision. Angling of this nature is not impossible; the writer has done it, and has seen it done, but he contends that it is difficult, and sometimes impossible to do without serious complications, and that the scleral route is much simpler and safer. As Pooley says in his article, Haab assumes that most foreign bodies are spindle shaped, small and smooth. The writer's experience is quite to the contrary, and so, evidently, is that of Pooley. The writer sees very few foreign bodies of this shape. Most of them are long, narrow and jagged, and this roughness is one of the reasons why the writer is so emphatically in favor of removing foreign bodies through the sclera, when it is possible to do so, for he is confident that dragging a sharp, pointed foreign body over the ciliary processes, the iris, the cornea, etc., must be much more dangerous than to remove it by the scleral route. The writer cannot, however, agree with Pooley that most of these foreign bodies turn broadside upon entering the eye. The writer thinks that most of them enter the eye in the direction of their long axis because most wounds show, by the narrowness of the aperture, that the fragment has entered the eye, not broadside, but in the direction of the long, narrow axis.

The writer is quite willing to agree with Pooley, that many particles of steel that enter the eye come fresh from the fire and are more or less aseptic, but it is not well to count upon this, and the writer certainly does not agree with him that it is just as well to wait a few days before removing the foreign body. The writer is quite confident, in his own mind, that the sooner foreign bodies are removed, the better. The mere fact that foreign bodies remain in the eye for a long time and are then removed, and the preservation of a good eye is maintained, is really no argument. This merely demonstrates that such things can happen. It does not demonstrate that it is wise or safe to wait any longer than is absolutely necessary before the foreign body is removed.

Pooley is quite right when he says that it is unwise to make any effort to remove the foreign body before its situation has been localized. Of course, cases are seen from time to time where the foreign body can be localized by a careful inspection of the eye—inside and out—with the ophthalmoscope, the transilluminator, etc., but as a rule it is better to have the foreign body localized so that the surgeon can know exactly where to look for it. Sweet's and other localizers are extremely useful for exact localization, but as a rule, a good front view X-ray picture and a good profile picture enables one to localize a foreign body with sufficient accuracy for all practical purposes, and ordinarily the time need not be taken for any more specific localization. Speed in removal is a decided factor in success, and in the preservation of eyeballs and sight, and the writer warmly advocates speed in X-ray pictures and in the subsequent removal of the foreign body. It stands to reason that the less time an eye is invaded by a piece of steel, which may or may not be septic, the greater the chance of a good result.

The writer quite agrees with Pooley that we should not use, what he terms a "trial pull" to ascertain the existence of a foreign body. Operators sometimes diagnose a foreign body in the eye by means of the external applica-

tion of the magnet instead of depending upon the X-ray. There can be no question as to the inadvisability of a procedure of this kind, for of course, when the magnet has approached the eye, the sharp, jagged steel is quite likely to be pulled up against the side of the eye, thus perhaps, invading the retina, the choroid, the ciliary processes, the lens, the iris, the anterior chamber and the cornea. The quieter a foreign body is kept when inside of the eye, the better, and it is strongly urged that in all suspected cases, the immediate use of the X-ray be resorted to for the diagnosis of the foreign body and its localization; and that this should be followed by its speedy withdrawal by the magnet. The writer cannot agree with Pooley in his remark that we should not try to remove a foreign body that is embedded in the choroid. He would certainly remove foreign bodies embedded in the choroid and in the retina, or in the sclera itself, provided they can be broken loose by magnetic power. All foreign bodies in the interior of the eye—wherever they may be—should be removed if possible. Unfortunately, some foreign bodies become so deeply embedded in the sclera that we cannot swing them loose. Of course, in this event, we have to leave them, but under all other conditions, they should certainly be removed if possible, wherever located.

Pooley's rules concerning the removal of foreign bodies are worth considering. They are as follows:

First: If the lens is badly wounded, so that it must become opaque, and the foreign body is situated immediately behind it, he removes the lens and then the foreign body, through the cornea. It is to be assumed that he uses the original wound as the avenue of withdrawal.

Second: This rule indicates that if the lens is not wounded, or only slightly wounded, or for other reason it is not desirable to remove the lens, and the foreign body is situated behind the lens, he removes the foreign body by means of an opening thru the conjunctiva and sclera.

The writer is perfectly sure that this

method of dealing with vitreous chamber steel particles is much safer than the one still advocated by Haab of practically removing all foreign bodies through the cornea. Haab's method of coaxing such particles forward, by means of the giant magnet, sounds nice, and of course, it can be done, but I do not believe it is often done in this very pleasant fashion. Most of these foreign bodies are drawn forward by main force, thru and over the ciliary processes, iris, etc., and out thru the cornea, leaving a trail of damages back of them, that are most jeopardizing to the safety and well being of the eye. It is almost inconceivable how this method can be considered safer than it is to to open the sclera, the choroid and retina, and bring the foreign body out thru this route.

Of course, there is some danger of detachment of the retina and of involvement of the retina and choroid in the scleral wound, and in some loss of vitreous, infection, etc. These dangers must be admitted, but they seem quite trivial, as compared to the dangers involved in the other method of extraction.

Before making the scleral opening, the foreign body should have been localized—either by X-ray pictures, a localizer, or both. The conjunctiva is then picked up with a pair of forceps and a large triangular flap is made in the conjunctiva, with the apex pointing anteriorly. The opening in the sclera is then made with a Graefe knife. This is made in the direction of the course of the muscles, between the muscles and as near to the location of the foreign body as possible. The scleral opening is made as far back as possible, in order to avoid the delicate structures in the anterior portion of the globe. The writer does not make a transverse section, as recommended in some cases by Pooley, as such sections encourage the evacuation of vitreous humor and the wounds do not heal as well after the operation. The opening is made as long as seems indicated, as estimated by the size of the foreign body, as seen in the X-ray pictures. A good sized opening is best because it is much bet-

ter for the foreign body to be extracted easily. The writer has devised two nonmagnetic hooks, very small in size, that an assistant hooks into each side of the scleral wound. By means of these hooks the wound can be gently retracted, or opened, which takes the place of the transverse incision, as recommended by Pooley. The assistant holds the lips of the incision apart with these hooks, while the surgeon manipulates the magnet. The writer has used this method for years and is quite satisfied with it.

An effort should be made to aim the point of the magnet in such a way that it is as nearly as possible on a line with the long axis of the foreign body. A foreign body can be much more easily removed in this way. If a foreign body, for instance, is long, and the magnet catches it in the middle, it might take an enormous opening to re-

move it, whereas, if we can only attract the foreign body in the direction of its long axis, it will easily come out thru a much smaller opening. This is a most important point in the removal of steel particles, and the writer has seen it demonstrated many times. Pooley recommends retroocular injection of the anesthetic. This is not necessary. A holocain, cocain and adrenalin mixture should be dropped on the eye until anesthesia occurs, and then the conjunctival flap should be made. Cocain should also be dropped on the other eye as it enables the patient to keep both eyes quiet. Then cocaine the sclera before making the incision. Patients never complain of the pain of the incision. They only complain of the pain induced by the attraction of the foreign body for the magnet. The writer never sutures the sclera. He merely sutures the conjunctiva.

TUMORS OF THE EYEBALL AND STRUCTURES ACCESSORY THERETO.

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PHOENIX, ARIZONA.

A review of recent literature with illustrative cases from the author's personal experience. Read before the Los Angeles Ophthalmic Society, February 19, 1918.

The purpose of this communication is to call attention to the more frequently encountered tumors of the eye. It, perchance, will refresh your minds as to the need, in certain instances, of greater urgency to make an early diagnosis, and to either eliminate the mass or remove the organ.

All parts of the eye and its appendages may be subject to invasion by new growths, varying widely in type and location. Snell reported¹ in 1916 a case of unusual interest, in that the growth was a large epibulbar melanosarcoma occupying two-thirds of the nasal limbus, and overlying a good portion of the cornea. The mass had eight distinct lobes each supplied by a separate blood vessel.

In general, we arbitrarily refer to growths involving the appendages and

external parts, and to those of the intraocular structures. In instances, particularly neglected cases, all parts may eventually become more or less involved. Much the greater proportion of growths encountered are malignant, some more highly than others. Many of those which may be classed as non-malignant, if not treated, cause widespread destruction, largely by mechanical means. Of the external growths, a good portion are nonmalignant, or only mildly malignant, yet all should be removed as there are no means of determining just how soon they may take on a malignant character. Of the intraocular types, by far the greatest percentage are malignant, which of course demand immediate removal of the organ.

During the past three years, there

have been about ninety-three papers or reports of tumor cases in current ophthalmic literature. Fully two-thirds of all reported cases were malignant, about one-half were intraocular. One-third were represented by the various types of sarcoma, which was followed next in frequency by neuro-epithelioma. Eleven of these papers come to us from Japan. Komoto,² in the *Nippon Gankwa Zasshi*, contributes to our knowledge of primary uveal tract sarcoma with notes concerning one hundred cases.

TUMORS EXTERNAL TO EYEBALL.

Regarding tumors affecting the external parts, both malignant and benign growths of the lids, caruncle, conjunctiva, cornea, sclera and orbit have been observed. Papillomas of the lids are of comparatively frequent occurrence. Freytag³ observed it in a child aged four years, and it relapsed several times after excision. Angioma, lymphoma, moles, epithelioma and sarcoma are occasionally encountered. The last named tumor, according to the number of reported cases, indicates the condition as uncommon. About eighty to eighty-five cases have been collected by Wilmer,⁴ Veasey,⁵ Alling⁶ and de Schweinitz.⁷

According to Birch-Hirschfeld⁸ most of the growths of the *lacrimal gland* are mixed tumors. He reports removing one successfully in a man aged 57 years. Some years ago, at my clinic at the Chester Hospital, I observed symmetric lymphomata of the lacrimal glands (Mikulicz's disease) in a colored girl aged 17 years. Many of the glands of the body were palpable including the parotids. At the site of the lacrimal glands were large masses giving the peculiar drooping of the angles of the lids resembling the eyes of a bloodhound. This was the second case I had observed, the first being one which Dr. Posey showed several years ago at the Wills Hospital. No cases were reported during 1917, but the year previous, Dr. Posey⁹ reported one, in a colored girl, in which positive tubercular and syphilitic reactions were obtained. However, Posey agrees with those observers who believe that in

view of the fact that no specific bacteria have been discovered, the condition is probably chemotactic.

Valli¹⁰ observed large papillomata of the limbus with invasion of the cornea, in three patients, aged 67 years, 56 years, and 54 years. The masses had been present 10 years, 6 years, and 3 years respectively. They were 10 x 12 mm. in extent. Excision and galvanocautery were used. The papillary character of the tumors was well marked, microscopically. Marchi¹¹ described two interesting cases of small tumor developing on the pannus, in eyes affected with trachoma. The masses were composed of plasma cells with an abundance of new formed blood vessels.

Epibulbar sarcoma, epithelioma, lymphoma, fibroma and *dermoid cyst* are at times observed. The last named growth afforded me an interesting experience upon one occasion. The patient, an Italian, was seen at my clinic at the Chester Hospital. He complained of a small swelling under the upper lid of the left eye. A tentative diagnosis of cyst, possibly dermoid, was made and yet, owing to the unusual location, just to the nasal side of the median line, the question of an encephalocele was considered. The mass was comparatively small and easily compressible against the eyeball. The small finger was unable to detect any opening in the bony orbital wall in the frontal nasal region. Believing I was dealing with a small superficial cyst, after a few instillations of cocain, I proceeded to remove the same. In a very short time I discovered how completely I had miscalculated the extent of the mass. It was necessary to greatly enlarge the field of operation, forcibly rotating the eye outward and downward, and carrying my dissection well in toward the apex of the orbit. Microscopic examination showed a dermoid cyst.

Growths involving the external parts have been treated in a variety of ways. Some by excision, others, as in the cases of epibulbar epithelioma reported by Collins¹² and also by Heckel,¹³ by the use of radium bromid. Massey¹⁴

recommends zinc ionization. The galvanocautery has been used. Several of my cases have been treated very successfully according to Clark's¹⁵ method of desiccation. It seems to me a most efficient and desirable form of treatment. The advantages being, better cosmetic effect, no hemorrhage, it can be repeated, and a large or small area can be attacked without the danger of a contracted cicatrix. Most growths can be removed without an anesthetic, but if desirable, a local anesthetic can be used.

Abscesses, tubercular tumors, angioma, osteoma and intradural tumors (cystic, fibrous, or glia tissue) of the orbit, all produce displacement of the eyeball, not only forward but in most cases deviation from the primary position depending upon the location of the growth. Of the osteomata, the majority are attached at points around the orbital margin. In Blanco's one case¹⁶ and Cirincione's series of three cases¹⁷ the growths were removed with comparative ease, and with little disturbance except in one case of the latter's. In this case the bony mass practically filled the orbit. The operation consisted in excavating a new orbital cavity.

At the solicitation of Dr. Bakes, of Phoenix, I was asked in consultation to examine a baby girl aged nine months. The parents stated that when the baby was aged two months, they noticed the left eye rather prominent. This gradually increased until it had assumed a position of great prominence. The lids did not close the fissure by several millimeters. Not any of the superficial vessels were engorged. The globe was directed forward, did not deviate and was not compressible. It moved in harmony with its fellow. The iris responded actively to light. The baby would direct the eye toward any bright object. The fundus appeared normal except, perhaps, moderately full veins. The radiograph was defective and gave no information. Owing to the absence of inflammatory signs, the moderately slow growth, and position of the eye, directly forward, a diagnosis of intradural growth, or at

least a mass in the muscle cone was made. The character of the mass, possibly being cystic, fibrous or composed of glia tissue. An opportunity to confirm the diagnosis was not obtained as the parents refused operative interference.

INTRAOCULAR TUMORS.

The comparative infrequency of *intraocular growths* in the routine experience of the oculist, compels one to turn to literature for much of his information. In considering the subject of intraocular growths, particularly those of a malignant type, it is well for us to bear in mind the fact that they are of more than local importance, as they frequently establish a clew to obscure pathology in other parts of the body. The metastasis frequently observed in sarcoma and neuroepithelioma are good illustrations. Early diagnosis, followed by immediate operative interference, has given to the ophthalmic surgeon a greater percentage of recoveries and freedom from transference to other parts of the body, than has been attained in general surgery. The reason for this is the fact, that early, the tumor is confined within a tough fibrous capsule; the sclera.

It is the part of wisdom to remember that an adult's eye with a history of being blind, suddenly becoming inflamed, hard and painful, is an object of serious suspicion, for frequently the smallest tumor can excite a glaucomatous attack. McGuire's first case of his series, published the past year,¹⁸ demonstrates the importance of this observation. His patient suffered a severe glaucomatous attack but, owing to the very hazy cornea, he was unable to examine the fundus. The fellow eye showed a large, deep suspicious cupping of the optic nerve, but no inflammatory symptoms. The field was good. Iridectomy was performed upon the inflamed eye without beneficial results. Enucleation revealed a sarcoma. With the exception of tubercle and gummatous growths, primary tumors of the iris and ciliary body are rare.

During the past year four reports of *sarcoma of the iris* appeared in current literature. Bell¹⁹ observed a primary

melanosarcoma of the iris, the eye was in the inflammatory or second stage. The diagnosis was confirmed microscopically, following enucleation. The condition is unusual. Fuchs²⁰ found primary sarcoma once in sixteen cases of uveal tract sarcoma. Moorfields Hospital Reports²¹ showed one in one hundred and three cases. Fuchs suggests that if the growth is small it may be removed by iridectomy. This measure seems to me to be a dangerous procedure, in that, owing to the opening of the blood stream tumor cells might invade the ciliary region. As a diagnostic aid it is permissible, but the

per²³ could find no primary focus in his reported case of carcinoma of the ciliary body. This is a most unusual observation, for authorities are agreed that the condition is always metastatic. It is an interesting observation in view of the frequency with which cancer is encountered in other parts of the body, that even metastatic cases are rare. One theory in explanation of this is the complicated manner in which the blood stream enters the eye.

SYPHILITIC TUMOR OF IRIS.

Regarding the more frequently observed condition affecting the iris,

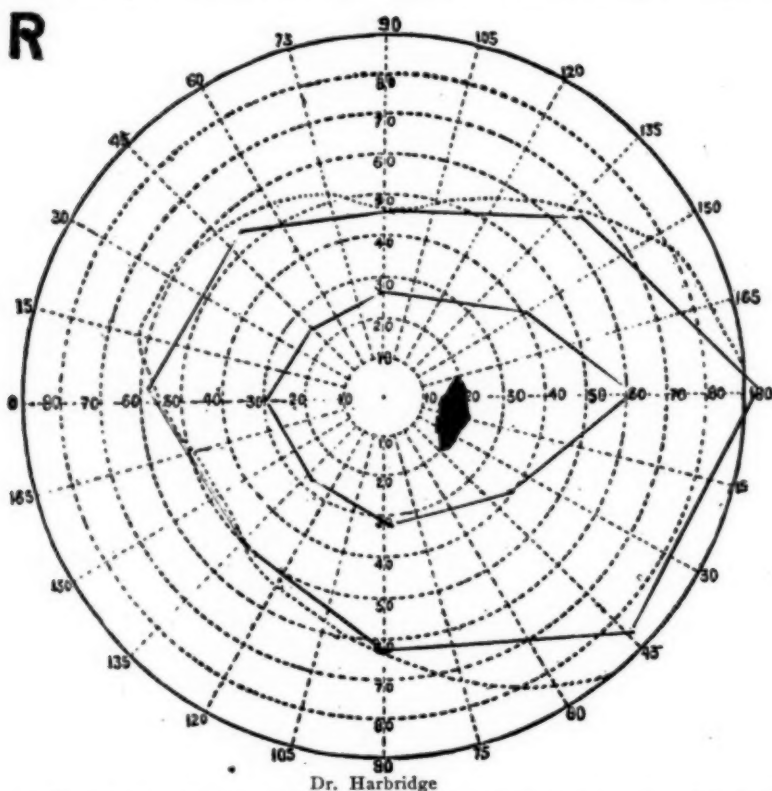


Fig. 1 Field of vision, right eye, showing enlarged blind spot in case of gumma. (Harbridge).

only safe thing to do is to sacrifice the eye.

Brown's case²² reported in 1916, which was diagnosed as glioma, proved upon enucleation, to be a bony tumor springing from the ciliary body. It was observed in a girl aged 18 years and was probably fetal in origin. Nee-

namely, gumma or papule, the following case history is of interest in certain details. D. A., aged 32, M. S., first observed December 26, 1917. Initial lesion early in June, 1917. In October he had an attack of iritis, first in one eye then in its fellow. Subsequent to this inflammation the eyes appar-

ently became quiet and remained so, until December 20th, at which time the left became painful.

Examination showed right pupil dilated, kidney shape, synechiae and several pigment spots on the anterior capsule. Left pupil under atropin dilated poorly. To the temporal side there was a broad bandlike attachment between the iris and the anterior capsule, the pigment border of the iris being free. Overlying this and placed rather

severe temple pain. I do not remember ever having seen a patient suffer so acutely as he did for the next three days. The entire temple region was suffused with blood, the superficial vessels standing out prominently. With the artificial leech 2 to 2½ ounces of blood were withdrawn, ¼ gr. doses of morphin were administered hypodermically 5 or 6 times the first 12 hours. Subsequent to this attack the mass began to lessen in size, and at the end of

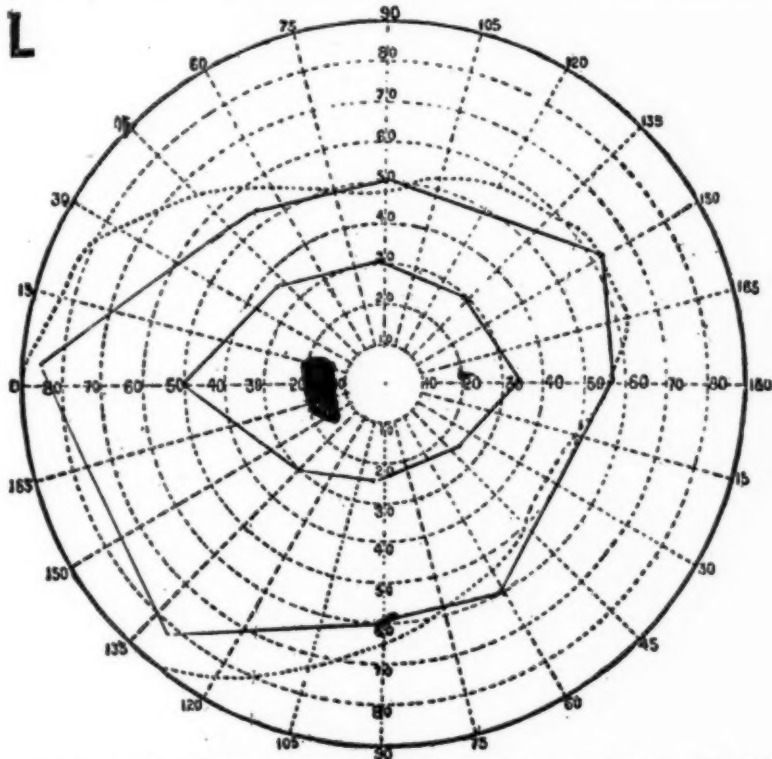


Fig. 2. Field of vision, left eye, showing enlarged blind spot in case of gumma (Harbridge).

more on the ciliary zone side of the lesser circle, was a yellowish brown mass, apparently pushing up from the crypts in the stroma of the iris. Deposits in Descemet's membrane were discrete, disc shape areas, larger, denser and not so numerous as in the usual type. The mass, about 3x4 mm. in extent, apparently sprang from near the center of the iris. It was single.

Two weeks after having been first observed, the mass being perhaps a trifle larger, the patient developed a

a month, practically disappeared, leaving a small area in which the pigment of the iris was absorbed and scarred. Two doses of salvarsan, K. I., mercurial ointment, and atropia were the remedies used.

I am inclined to believe this tumor mass partook more of the nature of true gumma rather than a late papule. There are features in favor of either view. It is quite common to refer to any elevation in the iris in syphilitic cases as a gumma, but it seems to me

the term should be reserved for the later and papule for the early stages. Papules usually occur early; Santos Fernandez²⁴ observed it as early as one month and as late as 4 years after the initial lesion. It is, as a rule, multiple, most frequently occupying the pupillary border, occasionally the periphery and much less frequently the lesser circle region. True gumma, which is far less common, is in many instances a much more serious matter. It occurs as one large mass, usually at the temporal side, at the periphery of the iris; but has been observed in the lesser circle region. It leaves a minute scar and pigment absorption which remains. The adhesion to the anterior capsule is a broad bandlike rather than a pigment spotlike attachment. It is an indication of a more virulent type of infection and foreshadows later certain nervous disturbances. The greatly enlarged blind spot in the visual fields of this patient may be a forerunner of a confirmation of this opinion.

SARCOMA OF CHOROID.

Doubtless a diagnosis of *intraocular tumor* of the deeper structures, in many cases, is never made, or at least only accidentally, as in Ramsay's third case,²⁵ following an injury. The eye was removed, believing there was present a detached retina. Examination showed a spindle-celled sarcoma. The order of frequency of occurrence of tumors of the choroid and retina is sarcoma, neuroepithelioma, and cancer, the latter being quite rare, and, as we stated, always metastatic. The two former are usually primary and very prone to metastasize to other parts of the body.

The four stages of these growths are, invasion and detachment of the retina, inflammation and increased tension, rupture of the globe and the stage of metastasis. Regarding the increased tension, some authors make the statement that it is purely mechanical, owing to the increase in size of the mass. This hardly accounts for all glaucomatous attacks, for many cases are on record in which the growth was very small. A much more tenable explana-

tion seems to me to be the theory of increased serous outpouring and the blocking of proper drainage, together with the location of the mass.

The striking feature in Jackson's recently reported case²⁶ of sarcoma of the choroid was its duration—over fourteen years from the time sight was noticeably impaired and two and a half after glaucomatous symptoms had arisen, until the eye was enucleated. Nettleship²⁷ reported a case of twenty-four years' duration. In Kipps' cases²⁸ the eye was enucleated twenty-two years after it was first advised.

This is in striking contrast with a case which I recently observed, but did not treat. In view of the above reports, I have wondered what influence, if any, the treatment had. The parents of a girl aged 10 years stated that they had observed that the iris to the nasal side seemed pushed forward during the previous few weeks. Examination. Vision 6/6 T. N., perforating vessels slightly engorged. The iris to the nasal side was bowed forward. By oblique illumination, well under cover of the iris, was a small mass, giving a greenish reflex. Despite a negative Wassermann, three or four doses of salvarsan were administered, upon the advice of the family physician who had treated the father for syphilis 12 years before. Tuberculin was administered for diagnostic purposes. Under the belief that both a general and local reaction was obtained, repeated doses of a considerable amount of O. T. were administered every three or four days for possibly three weeks. Within six weeks the mass had grown to very great size, pushing well over to the median line of the eye. Early glaucomatous symptoms developing, the eye was enucleated. Microscopic examination showed sarcoma.

In view of Jackson's paper intimating the long duration of sarcoma, I have wondered what influence, if any, the administration of tuberculin may have had in the matter of stimulating the growth to greater activity. In this connection it is interesting to note Hiram Woods' recently published experience with tuberculin²⁹ in the treatment

of choroiditis, in which the condition was greatly aggravated.

GLIOMA OF RETINA.

Neuroepithelioma, or glioma, is not without interest. During the past year six contributions to literature have been made. In Ring's reported case³⁰ interest centers in the fact of the great size, 20 inches in circumference, of the recurrent mass. The mass was removed by the bipolar d'Arsonval current using a chain snare. The operation was done in two stages, followed by Roentgen rays. The child lived five months. Metastases occurred in the region of the 8th and 9th vertebrae.

Taylor and Fleming's case³¹ is of interest, not only owing to its being bilateral, but because of the metastatic findings in the brain and meninges, vertebrae, mesenteric glands and ovaries. Berrisford³² in 1916 in his statistical report of the Royal London Ophthalmic Hospital, found that bilateral neuroepithelioma occurred in 14.6% of cases. Wintersteiner's observations³³ were that about 25% occurred. Griffith³⁴ found upon examining literature, a record of eight histories of transmitted neuroepithelioma. His own observation is of two families in which the tumor was transmitted by the mother. In the first family the mother lost one eye, and out of six living children, four had bilateral growths, while one lost one eye and one escaped. In the second family, the mother lost one eye, and of three living children, in one the growth was bilateral, and in two unilateral.

Bilateral neuroepithelioma is primary in each eye and is not transmitted from one organ to the other. The growth starts from the two granular layers of the retina. The exophytum usually begins as minute nodules spreading along the subretinal space forming a mound like deposit. The endophytum shows protrusion of the whole mass with a rather irregular surface toward the vitreous. Neuroepithelioma has been observed shortly after birth and as late as the third year. Two-thirds of the cases occur before the

third year. It is interesting to note that statistical reports from Moorfields during five years showed that seven out of twenty-four eyes enucleated proved to be pseudogrowths. In true tumor cases, the tension is plus, in pseudogrowths it is minus; yet in Sidney Stephenson's case,³⁵ which proved a pseudotumor, the tension was plus one.

The specimen presented is that of neuroepithelioma. The eye was removed by Dr. Brownfield, of Phoenix, from a little girl, aged two years. The parents stated that they had not noticed anything particularly wrong with the eye, and yet it did not seem to have the same appearance as its fellow. When Dr. Brownfield explained the nature of the disturbance and the necessity of immediate removal of the eye, the parents were very much shocked. They consulted several oculists in Phoenix and two or three in Los Angeles. These consultations were all confirmatory. Dr. Watkins, of Phoenix, also confirmed the diagnosis microscopically. A piece of the optic nerve was examined and showed no pathologic changes. Time, of course, is the only thing that will determine how successful the operation will prove in preventing recurrence and preserving life.

Thirteen percent of cases survive. Regarding this matter, observations differ widely. Adams' published report³⁶ in 1916 showed 54% well after three years, while Wintersteiner found only 16%. If a patient lives for over three years after the operation, it is considered safe. Yet recurrences have been noted as remote as five and a half years, and as early as one month after enucleation. Retrogression of the growth was observed by Meller³⁷ and also Purtscher.³⁸ A point of great importance, however, is to remove as long a piece of the nerve as possible, and have it examined microscopically. If any evidence of changes are present a complete exenteration is indicated. The case is more favorable if the growth has not passed beyond the *lamina cribrosa*.

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NOTES, CASES AND INSTRUMENTS

In this department will be published brief reports of cases, descriptions of new instruments, and notes or suggestions of interest to workers on ophthalmology.

CYSTIC BRAIN TUMOR WITH PAPILLEDEMA. AUTOPSY FINDINGS.

GEORGE F. LIBBY, M. D., D. OPH.

DENVER, COLORADO.

A youth in his eighteenth year was referred to me by Dr. M. Kleiner, for ophthalmic examination, October 16, 1917. The patient complained of daily headache, extending from the eyes to the occiput, associated with some nausea and occasional vomiting. There was a history of prolonged treatment,

with large doses of the bromides, for Grand Mal. Dr. Kleiner's diagnosis was Petit Mal. The patient was well nourished but defective mentally. He had been able to acquire a fair education, was of gentle disposition, but his mental action and speech were slow and hesitating. Correction of hyperopic astigmatism of moderate degree gave normal vision in the right eye, and about 5/8 in the left.

The ophthalmoscope showed clear media, normal retina, and the following appearance of the optic nerve heads:—discs irregular in shape, margins ob-

scure, glistening white deposits which obscured the physiologic cups as well as the lamina cribrosa, and opaque nerve fibres extending outward slightly from the borders of the discs. These nerve changes impressed the examiner as being congenital. The pupil reflexes were normal. On account of the patient's defective mentality the fields for form and color were not taken.

About November 15th the patient kept his bed, being markedly somnolent and lethargic, but recognizing friends on being aroused. There was slight vomiting. The pupil of the right eye suddenly dilated and the vision of this eye was found greatly reduced. The cutaneous and cremasteric reflexes and Kernig's and Babinski's signs were always present, the patellar reflex absent at times. There was also rigidity of the cervical muscles. But there was no delirium, fever (temperature constantly subnormal), headache or muscular paralyses. Thus, many signs of meningitis were present, and others absent. On the other hand, while a beginning optic neuritis suggested both meningitis and brain tumor, yet there were no localizing signs of cerebral pressure. Past and present tuberculosis, syphilis, and nephritis were excluded.

On November 19th an examination at Mercy Hospital showed widely dilated pupils with feeble reaction to light or convergence. Distinct optic neuritis had developed, the papilla being edematous and hyperemic, the disc outlines being lost in edema of the adjoining retina at some points (especially the upper temporal quadrants), with moderate swelling of the nerve head. No further retinal edema or hemorrhages were observed. The vision was reduced to barely recognizing faces.

Re-examination on November 23rd presented pupils dilated ad maximum, an immobile iris, and vision of counting fingers only. The nerve head was grayish white and slightly more swollen. The retina showed no involvement except in the immediate vicinity

of the disc. Its veins were somewhat dilated but not especially tortuous, the arteries were of normal caliber or slightly contracted.

Soon after talking with his parents, on November 25th, the patient's respiration apparently ceased, and could not be restored; although the heart continued to beat for 2½ hours, when death occurred.

The reports of the examination of the spinal fluid, on November 14th, and of the autopsy on November 26th, 1917, by Dr. Philip Hillkowitz, are as follows: (1) Cell count, 7. Globulin, faint opalescence. Wassermann reaction, negative.

(2) *Autopsy limited to the head.* On the median side of the inferior horn of the lateral ventricle on the right hemisphere is found an area of softening about 5 cm. in diameter and one cm. in thickness, of a gelatinous consistency. Parts of the wall are yellow in color and other parts streaked with blood.

The softened area from the wall of the cyst is about the size of a hen's egg, apparently connecting with the ventricle, the floor of which is situated in the lower temporal lobe about 1 cm. from the surface.

Contents of the cyst: a straw-colored fluid. The rest of the brain shows no deviation from the normal. The cyst seems to have been, partly at least, a result of the softening.

Parsons says: "The chief cause of papilledema is the presence within the cranium of some adventitious material, which may be solid or fluid. * * * Clinically the form of adventitious deposit which most frequently gives rise to choked disc, is tumor of the brain." Gowers and many other authorities agree with this; but an observer as careful and experienced as R. Greeff is inclined to give precedence to the various forms of meningitis. It has been shown that youth is much more liable to develop choked discs than age. H. L. Singer found 28 years to be the average in 51 cases of marked choked disc, out of 88 cases of brain tumor.

REPORT OF TWO CASES.

HOWARD F. HANSELL, M. D.

PHILADELPHIA, PA.

Read before the Section on Ophthalmology, College of Physicians, Philadelphia, February 29th, 1918.

CONCUSSION OF EYE AND REMOVAL OF TWO BULLETS FROM ORBIT.

M. G., aged 34, while explaining the inner workings of an air rifle presented by him to his little son on Christmas, 1917, accidentally pulled the trigger while the business end of the barrel was pointed toward his right eye. Two bullets, one round, the other ragged and of smaller size, struck the eye on its nasal side and entered the orbit. Vision = 6/20. The conjunctiva was torn and discolored but in the eyeball itself there was no hemorrhage, exudation or other change, except that the pupil was slightly dilated, reacted slowly and was not quite circular. Tension normal. Rotation inward restricted. No limitation of field. Objects were indistinct and seemed to be unsteady.

The presence of two foreign bodies was distinctly shown on the X-ray plate made by Dr. Manges. In his efforts to locate their proximity to the ball and to know whether either one was imbedded in the sclera, Dr. Manges made a second plate. The shadows on this plate he was unable to interpret. In addition to the two distinct shadows, five or six more, less marked, but similar in outline, were discovered scattered through the orbit. The preservation of intraocular normal tension and the absence of ophthalmoscopic changes confirmed the opinion that the bullets were outside of the ball.

By careful and tedious dissection the two bullets, so well shown in the first plate, were removed. The internal rectus was not divided or detached. The immediate result of the operation was to still further limit the internal rotation of the eye. The contraction of the internal rectus was hindered by exudation and blood. Two weeks later report from the patient by letter was that the eye was well and its usefulness restored.

There are, I believe, two kinds of air rifles on the market, one that fires a single bullet, the other several bullets, six or more. The patient stated that his was the first kind but he could not explain the presence of the two foreign bodies—one complete and round with the exception of a facet, and the other, half the size, irregular in shape with sharp and ragged edges. I ascribed the lowered vision to concussion of the eyeball.

PERFORATION OF CORNEA PERSISTING EIGHT MONTHS.

Case 2.—Miss M., a nurse in a hospital in a Southern city, contracted gonorrheal ophthalmia in the right eye, in January, 1917, while caring for a patient. The infection was severe. Notwithstanding great skill and care the cornea became the seat of a perforating ulcer. The infection was confined to the right eye. By May, four months later, all signs of inflammation had subsided and the conjunctiva had regained its normal thickness and appearance, but the perforation of the cornea had not healed. She resumed nursing and her ordinary pursuits. In January, 1918, she came to Philadelphia bringing a letter from her oculist stating that the perforation had persisted through all the months and no treatment had availed to restore the continuity of the cornea.

At this time vision R. (the affected eye) equalled 6/30; L. equalled 6/6. Tension of R. — 3. In the center of a circular gray opacity in the lower section of the cornea a minute dark point could be seen by close inspection. The iris was adherent to the scar and in contact with the remainder of the cornea. The aqueous humor escaped as soon as formed through the perforation.

A flap of conjunctiva was detached and sutured into such a position that the lower three-fourths of the cornea was covered by it. The anterior chamber was restored in twenty-four hours or sooner. The stitches were removed on the third day when the flap had gone back into its normal position. V. = 6/12, improved by a + 1 cyl. ax. 90°.

The unusual, interesting and, in my experience, unique feature in this case is the long continued—eight months—annihilation of the anterior chamber without infection or injury of any kind to the tissues posterior to the cornea.

WHY ARE THE LENS AND IRIS PUSHED FORWARD IN GLAUCOMA?

By OTTO WIPPER, M. D.
CHICAGO.

In the theories of glaucoma little is said with reference to this symptom.

are some objections to that theory.

The most plausible theory as to the cause of the plus tension seems to me the increase of fibrous tissue and the shrinkage of tissues in general occurring with advancing age, also affecting the evacuating lymph passages, thus restricting the outflow of lymph. There must also be a restricted inflow as long as no inflammation exists. Within the aqueous chamber the inflow is lessened by the contraction of the iris, and the inflow into the vitreous must be below normal, due to the pressure upon the secreting structures. But the restric-

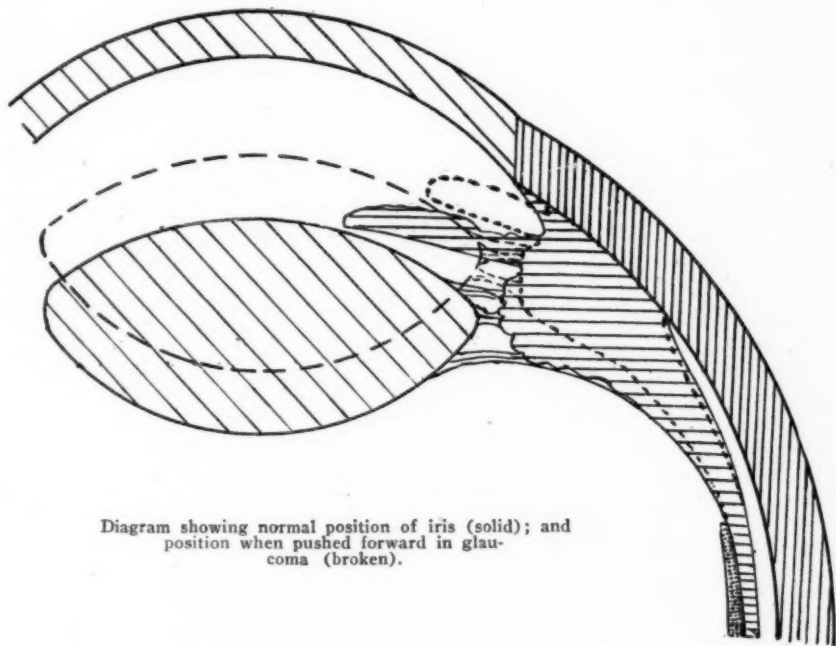


Diagram showing normal position of iris (solid); and position when pushed forward in glaucoma (broken).

According to Priestley Smith, the increase in tension begins in the vitreous chamber owing to the enlarged lens coming in contact with the ciliary processes, thus preventing the lymph from passing into the aqueous chamber. The partition formed by the lens, suspensory ligament and ciliary body, is displaced forward, equalizing the hydrostatic pressure of the two chambers, I simply mention this because an explanation is given for the pushing forward of the partition; otherwise there

tion of the inflow is less than the restriction of the outflow; hence the increased tension.

The ciliary body and iris are practically surrounded by three definite lymph spaces, except the area, where the pectinate or cribriform ligament is firmly attached to the sclera. These three lymph spaces are the aqueous and the vitreous chambers and the anterior portion of the suprachoroidal space, the latter extending about 4 mm. anterior to the ora serrata, where the attach-

ment of the pectinate ligament begins posteriorly.

The hydrostatic pressure within the three spaces being equal, any compression of the iris and the ciliary body must be mainly in the direction toward that portion which is not in contact with the lymph spaces. This portion, the attachment of the pectinate ligament, is quite anterior and broad, measuring about 4 mm. from the limbus to the suprachoroidal space.

While the anterior attachment of the ciliary body is broad and firm, the posterior is quite narrow and flexible where the structure blends loosely into the choroid. The lamina fusca within the suprachoroidal space is also a very loose tissue, and easily detached.

Having the anatomic picture in mind, considering that the delicate structures of the iris and ciliary body are almost entirely surrounded by lymph spaces, and considering the difference between the anterior and posterior attachments, one can readily see how the lens and iris are pushed or drawn forward.

In cases in which this displacement does not occur we probably have an obliteration of the anterior portion of the suprachoroidal space, and a more solid attachment of the orbicularis ciliaris to the sclera.

MUSCULAR ADVANCEMENT FOR STRABISMUS.

BY DR. FRANCISCO M. FERNANDEZ.

HAVANA, CUBA.

The surgical treatment of strabismus has been the subject of so many different procedures that since the time of Dieffenbach one may count by the hundreds the innovations claimed and the appliances created. In spite of that, we have still humor to try any new procedures that are recommended and on that account have tried for the past two years the method recommended by Reese which consists in the resection of a part of the tendon, with very extensive freeing of the *ailérons* ligaments and leaving undisturbed the original insertion of the tendon in the

sclera. Reese uses three sutures, one central, with number 3 silk, and two lateral ones, and he has devised a new strabismus forceps or clamp that is really useful in the minute details of the operation. The method of tendon shortening by excision of a central part of the same originated with Noyes in 1874, and although some modifications to the original procedure have been from time to time published, we believe that the most advantageous is the one described by Reese, although perhaps its chief indication lies in cases of comitant strabismus, and not in cases of paralytic squint or in heterophoria that need surgical treatment.

Our reason for that statement is that the extensive incursions made by Reese in the lateral invaginations of the muscle might in cases not due to comitant squint tend to increase the existing disturbances, while in those cases, due solely to a defect of the fusion faculty generally, the only thing to be remedied in cases of long standing and needing surgical correction is the deviation.

The operation described by Reese is, according to our understanding, a conservative one as it does not alter the relations of the original insertions to the sclera, but not so in the extensive incursions into the lateral invaginations, for even if there is the possibility of not doing a sufficient correction of the deviation with a conservative procedure, there is always the recourse to a new invention, while by the free dissections of Tenon's capsule, there is danger not only of disturbing the normal equilibrium of the eye, that in some small part may be due to those invaginations, but also in the cicatricial stage there might be the danger of retractions that may cause a torsion of the eyeball. Any of these sequels must be as distasteful to the patient as to the surgeon himself.

We do not pretend to criticise Reese's method of muscular advancement, for with some small limitations such as the extensive incursions into the fibrous bands that are in relation with the ocular muscles, we have followed it; and the results have been sat-

isfactory in eleven of the twelve cases in which we have used it. Eight of them have been reported recently to the Havana Academy of Sciences. The case in which we failed was subsequently corrected by the tenotomy of the opposite muscle.

Our purpose with this short and small report is to praise Reese's procedure and also to justify our fears of the dangers that too free division of the lateral invaginations may cause.

We believe also that by doing away with the piercing of some part of the scleral tissue as practiced in the majority of the cases, and this could be done by the shortening and suturing from one end of the tendon to the other, there are other dangers avoided. In the first place the danger of infection, which of necessity must be greater

when the sclera is wounded. Then the danger of reactions from the traumatism. And in the last term, the most important of all, the danger of piercing the sclera through, an accident that may occur to the most learned.

CONVERGENT STRABISMUS.

Age	Degree	Vision	Date of Op.	Good Result
35	15°	1/200	Apr. 1916	20 mo.
28	20°	.....	May 1916	19 mo.
19	12°	1/200	May 1916	5 mo.
22	25°	.....	July 1916	Oct. '16
25	35°	1/100	Aug. 1916	June '17.
18	40°	.....	Dec. 1916	Dec. '17
28	...	.....	Jan. 1917	Mar. '17
33	30°	.....	Feb. 1917	1 mo.
45	...	2/20	May 1917	2 mo.
16	20°	5/20	June 1917	Immediate
27	20°	.....	July 1917	Feb. '18

DIVERGENT STRABISMUS.

Age	Degree	Vision	Date of Op.	Good Result
17	25°	.....	Oct. 1916	Relapse
		Tenotomy	May 1917	Jan. '18

SOCIETY PROCEEDINGS

NETHERLANDS OPHTHALMOLOGICAL SOCIETY.

UTRECHT, DECEMBER 10, 1916.

Translated from the Nederl. Tijdschr. v. Geneesk., by Dr. E. E. Blaauw.

Ethylhydrocuprein Amblyopia.

J. VAN DER HOEVE presented a patient with atrophic discs and sclerosis of the retinal vessels (thin blood column, thick walls and local ectasias of the vascular wall). On account of pneumonia the man had received during 4 days 4 grams of ethylhydrocuprein hydrochlorid in doses of 0.2 gms., 6 times in 24 hours with milk-diet. After 3 days disturbance of vision occurred, and after 4 days amaurosis. The condition improved during the next two months; but important changes remained. Vision was lessened to one-third. There was total loss of color perception, and great disturbance of the light sense. He needed 10 times more light than a control person. There was slight diminution of the adaptation, and peripheric limitation of the visual field.

Directly after the poisoning retinal edema with normal vessels was present. Two weeks later there was narrowing of the vessels in O. D. a few days later in O. S., while the edema receded or disappeared in the macular region and disappeared. Van der Hoeve supposes that the drug poisoned both the nervous elements and the vessels and thinks its use undesirable. From the reports it appears that the hydrochlorid is the preparation least desirable.

DISCUSSION.—Schoute had seen a case which recovered. A patient had received 18 capsules of optochin during a pneumonia in Germany, although he became stone-deaf on the third day. The deafness disappeared after 3 days, but shortly after he became stone-blind. He stopped the medicine, recovered from his pneumonia, and Schoute found a month later V. O. D. 6/10, V. O. S. 10/10. The pupils reacted normally; but there was well marked hemeralopia and concentric narrowing of both visual fields. Discs showed normal color, while the retinal arteries were much narrowed.

Central Visual Acuity.—Because the examination of the visual acuity is often considered equal with an examination for the minimum separabile, Roelofs had made the examination with a number of objects of different lengths and widths. The minimum separabile, the angle under which the smallest recognizable interspace between two objects is seen, is no constant quantity. It varied between 22 and 89 seconds with the objects used. It may be, however, that the observation width of the minimum separabile is still a constant quantity, although the interspace itself is not. If two squares, the diameters of which are equal to the interspace, are used, with the first observation of separation the entire length will appear to be three perception circles. The true length does not need to agree with this. If one takes a long row of such squares, one may suppose that at the first recognition of this square-line the diameters of the perception-circles concur with the diameter of squares or interspaces. The diameter of a perception-circle was found for an emmetropic eye, about 50 seconds. The smallest perception width is therefore equal to the diameter of a perception circle while using squares. It is however not necessary that the same should be the case for lines. It appeared, that the smallest perception width for the same eye was at the utmost 40 seconds when using lines. It is recommended to use for this examination a few parallel lines, which are as broad as the interspaces.

The defects of the optical system can partly explain why the minimum separabile is smaller with lines. It does not however explain, why, with the cone as the visual unit, the minimum separabile and the smallest perception width can be less than one cone diameter. The smaller minimum separabile with increasing broadness of the lines can be explained through increasing contrast between two bordering cones.

DISCUSSION.—Schoute pointed out that Koster, determining the visual acuity with the aid of a black point in a white field, determines in reality the minimum separabile between two bor-

der lines. And he asked if he understood rightly, that always one cone should remain without stimulation between two points, which one wishes to observe separately.

Roelofs answered that in the experiment of Koster the minimum separabile is determined between two planes, the extension of which cannot be lost sight of. The interlying cone is not always unstimulated while seeing separation, but always the observed separation corresponds with at least one perception circle.

Late Detachment of Retina After Fall on the Head.

G. F. ROCHAT was asked by an insurance company regarding a myopic patient, the connection between an accident to a person with low myopia, who fell from a wheel, striking the back part of his head, and detachment of the retina supervening a few weeks later. He concludes that it is certain that after indirect trauma, which does not touch the eye, damage of different kinds to the retina is possible, including detachment. It is also known that a detachment can become visible many months after a direct trauma, because the original changes are invisible in the beginning. This is also possible with a detachment through an indirect trauma.

DISCUSSION.—Halbertsma found in the beginning no fundus changes in a girl, who had received a tennis ball against her eye and who complained of metamorphopsia. Some weeks later riding in a jolting car she noticed a sudden diminution of her vision, which appeared due to detachment of the retina that Halbertsma considered dependent on the jolting of the body. Wolff feared that, often unjustly, a trauma is fished from the anamnesis, which undeservedly is considered guilty.

Reilingh asked if in this case arteriosclerosis was present. De Haas accepted connection in two observed cases. Nicolai considered the connection difficult to prove.

Zeeman could not accept a connection as proved, but certainly possible, and in the case even probable.

Rochat was interested to learn the

different standpoints in this practically important and difficult question.

The Disease Picture of Blue Sclerotics.

J. VAN DER HOEVE demonstrated three members of a family in whom appear as hereditary anomalies, blue sclera, fragilitas ossium and otosclerosis. The bone changes were demonstrated with lantern slides. Heretofore only fragilitas ossium was known to be associated with the blue sclera. Dr. de Kleijn and the speaker could establish in a family of 22 members, in 4 generations, of whom 15 were examined, that ten times these anomalies were coupled with otosclerosis. An eleventh patient showed blue sclerotics and otosclerosis, but was yet free from bone fracture. A second family examined by the speaker in Groningen showed deafness with blue sclerotics and fragilitas ossium; indicating a connection between deafness and this disease complex.

The etiology of otosclerosis is still unknown and the question is whether the mesodermal tissue or the nervous tissue is primarily affected, or whether both are dependent on another cause. It is therefore interesting that the otosclerosis can appear as a part of an anomaly which can be explained by a poor disposition of the mesodermal tissue.

DISCUSSION.—Weve saw in the army a man with blue sclerotics, also suffering with otosclerosis, who had broken six times an arm or leg. Van der Hoeve mentioned that Peters considered this weakness of the bones a reason for exemption.

Operation for Lamellar Cataract.

A. W. MULOCK HOUWER referred to the publication of Krueckmann in the 90th volume of v. Graefe's Archives. About the same method has been followed for years in the late Prof. Straub's clinic, and has proved satisfactory. The essential is that the lens nucleus is brought into the anterior chamber. Nucleus is used in the clinical sense, being the part of the lens lying within the opaque layer. The opaque layer is formed by insufficiently developed lens fibers. The slight cohesion

of this lenticular layer makes possible the separation of the surrounding mass from the enclosed part. Straub's method is as follows: After fixation at the nasal side, a straight or curved needle is introduced subconjunctivally, after maximal dilatation of the pupil. With movements in different directions in the pupillary space the anterior capsule is dilacerated as much as possible, with the anterior cortex. The point of the needle is brot around the nucleus above or below in the vertical meridian, with the intention of bringing the nucleus into the anterior chamber. It will not always be necessary to bring the needle point behind the nucleus. One presses the nucleus-margin backward and the margin of the nucleus at the opposite side appears in front, and the nucleus turns into the anterior chamber. This happens chiefly when the anterior cortex has been very freely dilacerated. In other cases it is necessary to bring the needle behind the nucleus and by sculling motions to bring it carefully forward. The operation being finished atropin is instilled and the eye bandaged. It may now be that the lens-mass swells and dissolves. As this substance is as much before as behind the iris, the chance for glaucoma is less. In spite of the large dissection, only in the minority of the cases, increase of pressure follows. If this happens it is not because the iris closes the irido-corneal angle, but because the very swollen lens-substance in the anterior chamber closes the filtration spaces. Besides the theoretical it has a practical value. The introduction of the keratome is easy and the danger of iris prolapse very small.

The lens substance is extracted after subconjunctival incision with the keratome through the limbus. The place of incision is the one which the patient offers with the least strained fixation. What is not removed over the keratome point is removed with a Daviel's spoon. One should not be tempted to do too much on account of danger of prolapse of the vitreous, especially when the posterior capsule has been wounded. This second stage of extraction will not always be necessary. If

glaucoma is not imminent the absorption may be left to nature.

The last period is a black pupil or a secondary cataract. With the discission the posterior capsule should be incised. The more widely the anterior capsule has been opened the less the chance for after-cataract. If secondary operation is not yet necessary the posterior lens capsule is seen in the pupil as a translucent, glossy membrane. Mostly after one to two years, the fine foamy membrane in the pupil is formed from small vesicles or droplets, which is easily incised. When the patient moves to a region where no ophthalmologic help can be had incision of the posterior capsule must be seriously considered. Twenty-six eyes were operated in the Amsterdam clinic during 1910-1916, in 15 patients, 11 of which were operated in both eyes. Some were too young for determination of the vision. Of the others the vision was after some years: 5 times $1/3$, 8 times $1/2$, 3 times $3/4$, and 5 times 1. The average time between the first operation and the prescribing of the glasses was 7 weeks.

The nucleus was brought into the anterior chamber in all cases except two. In one it came into the anterior chamber later spontaneously. In the other (the first case of the series), where only a large puncture was made, the extraction of the lens substance produced an iris prolapse, which had to be excised. Later glaucoma appeared which healed after sclerotomy. This case was the inducement later to carefully bring the nucleus into the anterior chamber. Removal of lens substance was done in 16 cases, 9 times on account of rise of tension. In 20 eyes, discission was performed 25 times. Indication for operative interference is a vision $1/4$ or less. Once the operation was done with a vision $1/3$ because the eye was myopic. The limit of $1/4$ seems a little high, as it is insufficient for the better situated. For these the loss of accommodation weighs against the advantage of increased vision. For the lower class, the "unskilled loose workmen labor," the wearing of spectacles is an objec-

tion. In some cases operation might be delayed until the patient has chosen a trade.

DISCUSSION.—Dubois pointed out the rise of tension is less frequent with the old method. He thinks the operation quite difficult. It is not advocated for the myopia operation, as being less innocent. He prefers the less dangerous way. Blok stated that after a large discission, as he used to do, the nucleus comes by itself in the anterior chamber or can be brought there by massage. He only very seldom saw glaucoma. Faber preferred the most simple method, large splitting, after which much lens substance comes into the anterior chamber and resorbs without danger from tension or prolapse. Van den Borg leaves the resorption to nature, as time is of no consequence.

Snellen does not consider such an unusual manipulation necessary. After a large discission the nucleus always appears in the anterior chamber. He cautions against hurry. However, a too cautious puncture is not advisable, as this produces a troublesome thick secondary cataract thru inspissation of the lens. Verwey lets the aqueous humor out after puncture, which favors the displacement of the nucleus into the anterior chamber.

Mulock Houwer agrees that the rise of tension is greater with a large puncture than with very slight puncture; he did not mention prolapse of the iris. He noticed from the discussion that the members like to see the nucleus in the anterior chamber. His chief aim was to draw the attention to its value. He could not agree that the described method for furthering this is combined with special difficulties or dangers.

The Quick Phase of Spontaneous Nystagmus.

G. F. ROCHAT mentions that little is known of the mechanism of the so-called spontaneous or amblyopic nystagmus. We have no certainty of the paths along which the impulse of vestibular nystagmus travels. The slow phase of vestibular nystagmus is caused from out the vestibulum, the quick phase goes over other paths, as

is known from observation of cases of supranuclear conjugate paralysis, where the slow phase of the caloric vestibular nystagmus can remain as a conjugate deviation, and the quick phase is absent. By experiments of Bauer and Leidel, where the quick phase of the caloric nystagmus still was present in decerebrated rabbits, it has become improbable that the stimulus reaches the ocular nuclei via the cerebrum.

The observation of cases of supranuclear conjugate paralysis has taught that the innervation of the quick phase for the optical nystagmus, which originates while viewing rapidly moving objects, follows another way than the slow phase, and that it probably originates in a similar manner as the vestibular nystagmus.

The innervation of the amblyopic nystagmus is entirely unknown, and also of the related congenital spontaneous nystagmus. The different theories agree that the nystagmus originates from impulses which continuously oppose each other and exercise their influence on the position of the eyeball, and which are suppressed by fixation. The cessation of fixation is then the cause of the nystagmus.

Rochat now relates some observations, from which it would follow that the fixation is rather the origin of the nystagmus. A 15 years old girl, with lamellar cataract and congenital nystagmus, had parallel position of the globes while seeing with both eyes, and "rück"-nystagmus toward the left. The static organ as far as could be detected was not damaged. If now the best seeing eye (right) was covered, the nystagmus toward the left would become a conjugate deviation toward the right; and both eyes remained quiet in the deviated position. It was here apparent that the nystagmus originated from the fixation, the quick phase therefore was excited thru the optic nerve, primarily, as a central disturbance of development. A poor balance for the lateral eye movement was present, thru which the rest-position was a conjugate deviation, and the nystagmus originated from the struggle between

this deviation and the fixation stimulus.

DISCUSSION.—De Kleijn warns against the schemata of Bartels, which start from the supposition that these reflexes pass through the cerebrum. After extirpation of cerebrum and cerebellum otogenous nystagmus still appears, the schemata are therefore insufficient.

Waardenburg suggested the need for a good method to register the nystagmus, and questions if it is known where the congenital nystagmus originates and if the influence of the labyrinth has been investigated?

Rochat mentioned different registration methods of Coppez, Abrahams, Ohm, Sackowitz and Struycken. They all can be improved. Little seems known of congenital nystagmus.

Waardenburg thinks that if good vision be necessary for the development of the nystagmus, it could not be explained in the cases of amblyopia and nystagmus. Rochat presumes here other causes.

Etiology of Uveo—Parotid Fever.

H. WEVE relates the histories of two cases of acute double parotitis, with months of swelling, combined with simultaneously appearing iridocyclitis. Lues, tuberculosis and pseudoleukemia could be excluded (this was not done by Heerfordt, 1909). In one case connection with epidemic parotitis was apparent. Probably Heerfordt's cases are abnormal cases of epidemic parotitis with an abnormal course. One of the patients had a recurrence 4-5 months after the first attack and was demonstrated at the meeting.

DISCUSSION.—Rochat saw in 1904 a similar case with tendency to recidives, so that one eye became very bad.

Hattink saw a similar case, which at first seemed severe, but under Fowler's solution progressed favorably.

Weve only treats symptomatically, when the course is benign. He thinks that the serum of patients, who had gone thru an acute epidemic parotitis, is curative, and intends to use this if the progress of the course is unfavorable. The vitreous opacities in the

case of Heerfordt suggested tuberculosis and this had induced him to try tuberculin treatment. (Speaker had later the opportunity to give the patient 40 cc. of serum from a patient who went through an acute epidemic parotitis 14 days previously. The result on the iris nodules meanwhile formed was not yet clear.)

Fuchs thinks, after observation of three cases of Mikulicz' disease, that these affections cannot be sharply separated. He mentions having observed some cases which clinically connect the cases as observed by Heerfordt, and the symptom complex of the Mikulicz' disease. He saw three cases where a swelling of the parotids and tear glands were combined with a double irido-cyclitis. The first was a girl who suffered since some years with diarrhea, and who had a thick face since a short time, pain in the eyes and poor vision. The parotids and tearglands were distinctly swollen, and an acute irido-cyclitis was present. After 8 or 9 months all symptoms had disappeared. The second case was a woman of 40, who came on account of poor vision. She had irido-cyclitis. In its course after some months a hard swelling of both parotids and tearglands developed. She was nursing. The third was a woman of 47 years old, who suffered with chronic muscular rheumatism. Also here the hard swelling of parotids and tearglands appeared some months later than the irido-cyclitis. The reaction of Pirquet was negative. In the two last cases vitreous exudation occurred, which reduced the vision below 1/10. Subconjunctival sodium chlorid injections acted favorably and brought vision back to nearly normal.

Weve states that Mikulicz' disease is tuberculosis, lues or pseudo-leucemia: these three he could exclude.

Neuro-retinitis arsenicalis.

H. K. DE HAAS, referring to his communication of May last, now speaks about 13 cases.

De Haas since has elaborated his experiences in another paper, an abstract of which will appear in this journal.

CHICAGO OPHTHALMOLOGICAL SOCIETY.

Meeting of March 18, 1918.

DR. HEMAN H. BROWN, President, in the Chair.

Severe Ocular Injury by Broken Spectacle Lens.

DR. WILLIS O. NANCE presented the case of Eugene C., aged 30, who, while working at the trade of machinist, on December 29th, 1917, was struck on the head by a falling ladder. He was wearing rimless spectacles. The right lens was broken and he sustained a horse shoe shaped incised wound of the conjunctiva, sclera and choroid of the corresponding eye. The wound occupied the inferior temporal aspect of the eye and extended from the limbus, approximately 8 mm. downwards and outwards.

He saw the patient at St. Bernard's Hospital about midnight of the day he was injured. Vitreous and shreds of choroid were protruding from the wound, and the iris drawn down into its lips. The protruding shreds were abscised. A firm bandage was applied and the patient kept in bed. He left the hospital January 14, and was under observation until February 10th, when he returned to his work. At the time of discharge, the vision in the injured eye was 20/50 minus. The wound healed splendidly and the cicatrized surface was smooth and regular.

The infrequency of such injuries is shown in the report of Hans Lauber, who states that he has only seen five cases in 150,000 eye injuries, or a proportion of but one to 30,000. His first case was seen after he had observed 85,000 cases of ocular injuries. After referring to other cases reported in the literature, Dr. Nance quotes from a report he presented to the Society 11 years ago in which he drew the following conclusions:

1. That injuries to the eye by broken spectacle lenses are extremely rare, and that the popular prejudice against the wearing of glasses by children, on the theory that the eyes are likely to suffer injury by the lenses being broken, while worn, is founded

more upon fancy than upon clinical evidence.

2. That wounds of the ocular appendage and surrounding parts by broken spectacle lenses, while not common, occur much more frequently than those involving only the eye itself.

3. That injuries of this character occur much more frequently among wearers of spectacles than nose glasses, probably for the reason that the latter being held less firmly before the eyes, are displaced by violence sufficient to break the lens.

4. That by far the greatest number of injuries result from the breaking of rimless spectacles, there being no instance in the author's series of cases where injury was induced by the rimmed variety of spectacles.

5. That injuries of the kind indicated are extremely rare in patients under 14 years of age, that they occur more frequently in females than in males, and that the wearing of veils probably holding the lenses more firmly in position upon the patient's face, has a tendency to increase the danger of injury.

Personal observation and the reports in the literature since that time do not lead the author to change his views.

DISCUSSION.—Dr. Frederick D. Vreeland stated that the case presented by Dr. Nance reminded him of one described by Dr. Ringueberg several years ago. From that standpoint, it was interesting to know the amount of injury that could occur by laceration of the eyeball and still prompt recovery take place. In the case of Dr. Ringueberg, the injury was greater than in this case of Dr. Nance, yet it healed kindly and the man returned to work in 16 days thereafter. This is largely due to the aseptic properties of the glass and the clean cut edges, as well as the approximation of the parts following the injury.

In deciding whether there still remains in the eye portions of glass, some have insisted on taking an X-ray picture, but the X-ray does not show very much if the glass is of the lead-free variety. Dr. de Schweinitz has de-

scribed a case in which a piece of glass remained in the choroid for ten years without causing any apparent irritation, showing that the eye would tolerate glass to a greater degree than some other foreign bodies.

As to rimless spectacles, the speaker also observed they were worn in the majority of cases, and that nose glasses did not occupy a fixed position and were easily knocked off. In most of the injuries previously reported the patients wore concave lenses which have thin centers. It is the sharp edges in the centers of minus lenses that produce laceration. Convex glasses are more protective. A large object striking an eye would produce serious injury independent of the lacerating tendency of the glass, while small objects are deflected by the presence of the lens. In a former report, contrary to what Dr. Nance had said, the speaker found that more men's eyes were injured in this particular manner than Dr. Nance had stated, and the ophthalmologists interviewed at that time were of the opinion that these eye injuries most frequently occurred in men who were engaged in industrial pursuits. The injury though was often the result of a household accident, or to those engaged in athletic sports. From an industrial standpoint a large majority are protected by lenses.

Dr. Thomas O. Edgar of Dixon, Illinois, speaking of these injuries of the eye from glasses, said that he could recall one case in his private practice, occurring a year ago. The patient, Sister B, bumped her face against the corner of a drawer breaking her rimless spectacles. She at once felt a foreign body sensation in her eye. She was found to have in the naso-central portion of her right cornea a 4 mm. vertical wound, penetrating deeply and obliquely to the surface. Although there soon developed a faint injection in the ciliary region the wound promptly healed and the recovery was uneventful. Her lenses were convex.

This afternoon he saw a second case (Mrs. A.) with an injury of the left eye of a type similar to that existing in Dr. Nance's patient shown this even-

ing. The woman was found by her family eight days ago on the floor in a convulsion. The left lens of her spectacles (which were of the ordinary gold rimmed type), was found to be shattered and her left eye bloodshot. It was thought her face had come in contact with the stove. The eye when seen for the first time this afternoon exhibited an ovate shaped pupil, having its apex adherent to the infero-temporal angle of the anterior chamber. The conjunctiva at this point formed a bulla 4 or 5 mm. in diameter but the iris did not present through the wound and there was no positive evidence of any break in the continuity of the conjunctiva.

A marked exophthalmos in this patient rendered her eye more liable to this sort of injury. One cannot be sure in this case that the spectacles, either lens or rim, caused the injury. A report ten days later showed recovery with corrected vision same as when tested a year previously.

Dr. Fred W. Bailey, Cedar Rapids, Iowa, recalled four cases he had seen in the last ten years. One of them was in a young girl, 8 years of age, who was wearing spectacles with rims. The injury was caused by a boy playing and striking the glasses with a poker at school, breaking the glass and cutting both corneas and iris. The other three cases were all adult men, and all of them wore minus glasses and were myopics.

Dr. Clark W. Hawley stated that his experience with injuries of the eye from broken spectacles was very small indeed. He had seen but one serious case. An insurance adjuster came to him with a history of broken spectacles, and he removed from the cornea several small pieces of glass. No scar was left. The wound was not deep enough to leave a scar. This was the only injury of the eye he had seen in clinic work or in private practice.

Dr. Alfred N. Murray said that he had reported a case to the Society two years ago of extensive injury to the eye from a broken spectacle lens. It was a golf ball accident, the patient wearing a minus toric lens of about

two and a half diopters. When the patient was brought to the hospital he had a corneal wound about four millimeters long with prolapse of the iris. This was excised, and about a week later, when the eye was quiet, he noticed an irregularity in front of the pupil almost at the center of the cornea, and on touching it with a probe found it was a piece of glass; it prolapsed into the flocculent lens matter which, since the injury, was present in large quantities in the anterior chamber. He extracted the glass by elevating it on the tip of a keratome, and introducing a forceps through the corneal wound, picking it out from the flocculent lens matter.

The cataract gradually became absorbed and left the anterior capsule attached to the posterior surface of the cornea. He incised this attachment with a knife needle and at the same time did a discission of the posterior capsule. At the end of a year the patient had 20/24 vision with the injured eye, which was certainly a good outcome considering the nature of the injury. Patient still had the strabismus which he mentioned at the time he reported the case. There still remained, after three years, a small spicule of glass at the site of the original corneal wound where the iris prolapse had occurred. This appeared to be more or less encapsulated, the eye was perfectly pale, and the patient had had no further trouble with it. He saw no reason for interfering with it.

He reported this case to show what an extensive injury can occur without losing the eye. It also showed what could be done in the way of conserving vision under such circumstances.

Non-Pigmented Intraocular Neoplasm in an Adult.

DR. NANCE exhibited a patient, 24 years of age, whose occupation was that of camera operator, he having been employed in this line of work for several years. Eight months ago, in Los Angeles one afternoon he was playing ball and noticed that he could not see very well, that things appeared to be blurred. Up to this time his sight

was pretty good. Shortly after noticing this blurring of vision he returned to Chicago. His mother told him that she noticed something white in one of his pupils. He secured a position in Chicago in which he was required to do considerable near work, and having some headaches he consulted the speaker on March 16. Up to that time no physician had examined his eyes.

The patient has an intraocular growth that seems to arise from the superior temporal aspect of the eye, probably from the retina or choroid, and extends downwards and to the nasal side. Apparently it is well circumscribed, of yellowish white color, and has several well defined blood vessels extending over it. Those members who had seen gliomata would recognize at once what appears to be a growth of that nature. As is known, glioma never occurs in adults. One man's guess was about as good as another as to what this growth is. Fuchs states that sarcomata of the choroid are almost always pigmented, and non-pigmented, so-called leucosarcomata very rarely occur. Whether this is a leucosarcoma or not he did not know. He would be inclined to give that as his best guess.

The growth is well defined. It is opaque on transillumination, and vision is nil. Patient is not able to perceive light. The case is very interesting. In his experience of nearly 20 years, with a rather large clinical experience of 13 years at the Illinois Eye and Ear Infirmary and in other institutions, and in his private practice, he does not recall having seen a nonpigmented intraocular growth in an adult.

DISCUSSION.—Dr. Vreeland said such cases were interesting from a diagnostic standpoint. As to the origin of this growth, from its location he was rather inclined to believe it sprang from the ciliary body. Growths from the ciliary body are not observed early as a rule, until they can be seen through the pupil. In one particular case he recalled the growth was situated on the choroid farther back, and he advised consultation. A diagnosis of intraocular tumor was made. Trans-

illumination was perfect. Needle puncture was resorted to which indicated there was a tumor present. There was more resistance than normal. He decided to trephine and see if the detached retina would go back into place, but the patient went back to Iowa and he did not have a chance to do it. He asked for an expression of opinion in regard to trephining in such cases.

As to Dr. Nance's case, he thought it might be called a leucosarcoma. The vascularity in these cases was variable. There was some vascularity in this case, but there did not seem to be any irritation of the iris. Growths springing from the ciliary body sometimes push forward and cause iris displacement, while syphilis and tuberculosis cause early iritis, which does not obtain in this case.

Dr. Clark W. Hawley stated that he had removed an eye which presented a picture very similar to the case related by Dr. Nance, but the growth proved to be malignant. When the patient first came to him he had vision in certain fields. Finally, vision was lost and he told the patient that he had a growth in his eye which might or might not be malignant. The probabilities were that he would be better off without that eye than with it. He would be inclined to hesitate in deciding whether this growth in the case of Dr. Nance was malignant or not. In his own case the tumor arose from the outer portion of the retina well forward and extended downward and inward. It was entirely retinal.

Dr. Oliver Tydings said that the report of Dr. Hawley brought up the possibility of whether this might not be a form of retinitis proliferans with a tuberculous base. The fact that it was nonpigmented would show that the growth did not arise from the choroid but was of retinal origin.

Dr. Nance stated that he had intended to say that tuberculin was given in his case and a Wassermann test made within the last ten days, both of which were negative.

Dr. Tydings stated that instead of making a von Pirquet test, he would start the patient with two milligrams

of tuberculin and see if he could not get a reaction. If he did not get a reaction he would give the patient three milligrams, and follow that with four, perhaps the next time with six, to see if he could not get a reaction.

With regard to trephining in cases of sarcoma, he did not know of any one who would advocate cutting into a sarcomatous growth. If there was a possibility of making a diagnosis ordinarily of melanosis, the history would clear that up, and that would be in a case of trauma where one would have hemorrhage from the subretinal vessels. There one would get a tumor that looked like sarcoma. If one took the history of the case he could generally elicit trauma; and following on that, within a few months, one would have a blood clot settling down in the lower part of the globe, with detachment of the retina. He would hesitate very much to trephine in a case of sarcoma.

Dr. William A. Mann reported a case that turned out not to be a tumor, but a case where he made a diagnosis of glioma in an adult. The patient's eye had a similar appearance to that of the eye in the case of Dr. Nance, but there was no red reflex. The growth or mass seemed to lie back of the lens, pushing the lens forward. The pupil was slightly dilated. The eye was removed and proved simply to contain an umbrella detachment of the retina. The retina was folded in behind the lens.

Dr. Michael Goldenburg asked Dr. Nance whether he resorted to puncture with the hypodermic needle to see if there was any fluid present. (Dr. Nance replied that he did not.) From a hasty examination he judged that the vascularization was purely retinal. The mass was translucent. He saw a case a number of years ago similar to this which was presented by Dr. Parker and discussed by the elder Gradle. This looked very much like an intraocular tumor, but these cases were usually accompanied by intraocular tension. Sometimes this tension was absent. Lack of vascularization was rare in sarcoma. That it might be a well de-

fined detachment of the retina was possible.

As to trephining in these cases, he could not see any particular advantage of that over mere puncture with a hypodermic needle. If one should get fluid and the detached retina prolapsed, that would settle the argument. The trephine simply makes a larger opening.

The question of whether the growth was malignant or nonmalignant could only be determined after its removal and sections made. If it was merely a well defined detachment of the retina, it would exclude the possibility of enucleation. Sarcoma of the retina was exceedingly rare; he had never seen one, and they saw as many intraocular tumors at the Chicago Eye and Ear Infirmary as in any part of the world. These tumors usually spring from the tissues in the region of the ciliary body, or at the junction of the choroid with the disk. In other parts they are very rare. The translucency of the mass, the lack of vascularization makes one skeptical.

Dr. Robert von der Heydt related some of the experiences in relation to cases of intraocular tumor. Eleven years ago he refracted a girl whose vision was normal in each eye. Nine years ago he refracted her and could not raise her vision beyond 20/100 in one eye. On investigation he found melanosis in the roof of the eye. This diagnosis was verified by Dr. Phillips and by Dr. Montgomery. Two weeks later he enucleated the eye.

Within the last two years he saw a case of detachment of the retina where there was a pigmented proliferation in the detached zone, there was reapplication and redetachment; and he had seen it go through three or four of such changes in the pigmented zone.

Within the last month he saw an interesting case of spontaneous detachment of the retina, with sudden, unexpected reapplication and absolute disappearance of the detachment, and again last week a redetachment. He was inclined to think in connection with Dr. Nance's case, in view of the possibility of sarcoma, its danger to

life, and because of the blindness, enucleation should be advised.

As to the value of the Wassermann test in this case, a positive Wassermann can be due to a malignant growth. In a nonsyphilitic, he has recently seen such a reaction due to a very small carcinoma on the tip of the tongue.

Retrobulbar Neuritis Due to Syphilis.

DR. THOMAS FAITH reported the case of a man aged 45, painter and paper hanger, first seen on Jan. 21st, 1918. Patient complained of losing vision for two or three months. R. V. = 6/200, L. V. = fingers at 3 feet. General health good except previous to 10 years ago when he suffered from rheumatism for a period of 2 or 3 years. Patient denies lues but has a distinct adenopathy and scar on penis; has been exposed to fumes of wood alcohol a number of times but never made sick or prostrated. For the past 5 or 6 years has been working as boss in a gang of paper hangers. There is no family history of blindness.

Both optic nerves have the appearance of a postneuritic atrophy; i. e., they are pale but not excavated. Patient complains of no pain but a feeling of soreness when he moves the eyes about, in extreme excursions. Has a well marked central scotoma for red and green in right eye; sees white yellow and blue in the central part of the field, but form field is contracted. In the left eye, sees only yellow, blue and white over a very limited area, to nasal side of the central fixation point. He can occasionally distinguish red with a 15 mm. square in the lower nasal quadrant about 15° or 20° from the fixation point. No symptoms of tabes or lead poisoning. Patient not a smoker, and only a very moderate drinker. Urine analysis negative. On January 4th, first fields were taken and condition above stated was found and charted.

Patient was put upon calomel $\frac{1}{4}$ gr. doses for a few days. This was followed by a saline, and later Turkish baths on Jan. 29th. After two Turkish baths R. V. = 20/160, L. V. = fingers at 6 feet. K. I. then ordered. Be-

gun with gr. x and increasing to gr. xxx t. i. d. Patient seen again Feb. 4th. R. V. = 12/20, L. V. = fingers at 5 feet; sent to Michael Reese Hospital. On Feb. 6th, complete nervous examination by Dr. Sidney Kuh, who reported nervous system negative. Wassermann made at this time showed blood ++; spinal fluid ++++; count normal. At this time R. V. = 7/200, L. V. = fingers at 3 feet. Patient put on inunctions of 3i of ung. hydrarg. per diem; also saturated solution of K. I. beginning with drops xv and increasing 3 drops each day. This was continued for six days, when 6 gm. novarsenobenzol was given intravenously. Vision seems slightly improving. On Feb. 17th, R. V. = 13/200, L. V. = fingers at 6 feet.

We are all more or less familiar with the typical toxic amyplopias, the chief symptoms of which are reduction of vision, with relative central scotoma, with or without ophthalmoscopic changes. The ophthalmoscopic changes when present usually only amount to blurring of the disk margins and pallor of a sector of the temporal side of the nerve head, when the case was recent, or which might give the entire disk an atrophic appearance if the case was an old one.

Authorities state that hereditary optic atrophy may occur either with or without central scotoma; that multiple sclerosis frequently has as one of its symptoms a retrobulbar neuritis, and that atrophy with or without central scotoma may be one of the very earliest symptoms of tabes or general paresis, sometimes antedating all other symptoms by many years.

Nonne records the existence of retrobulbar neuritis in syphilis and calls attention to the fact that the disease does not necessarily run a uniform course in both eyes. Alexander states that these cases are usually cases of perineuritis affecting the periphery of the optic nerve and thereby causing the central disturbance, since the peripheral fibers go to the macular region. Real cases of retrobulbar neuritis, if unrelieved, degenerate into atrophy; and Nonne among others, believes that

cases of isolated optic atrophy of luetic origin do occur, which never do develop into tabes, general paresis or multiple sclerosis. But this can always be questioned. The question that naturally occurs to one in the presence of such a case is: Is this case one of retrobulbar neuritis resulting from the toxemia of lues, or is the optic nerve lesion but the forerunner of one of the

grave diseases of the central nervous system which occur in syphilis?

DISCUSSION.—Dr. E. R. Crossley stated that a retrobulbar neuritis, with a few exceptions of direct infection, may be said to result from an acute or chronic absorption of toxins, generated either within the body or coming from without.

DIFFERENTIAL ETIOLOGY.

Acute Retrobulbar Neuritis.	Chronic Retrobulbar Neuritis.	Toxic Amblyopia.
Absorption Acute. Toxins generated within body. Toxins of infectious diseases. Acute diseases.	Chronic or continued. do.	Chronic or continued.
Influenza, Diphtheria, Malaria, Scarlet Fever, Rheumatism, Syphilis.	do.	do.
Injuries to the orbit and extension of inflammations and diseases from the accessory sinuses.		
Chronic diseases.	Chronic Diseases. Uremia of Nephritis, Malaria, T. B., Auto-Intoxication, Diabetes and Syphilis.	Chronic diseases. do.
Absorption from without the body. Drugs, Chemicals and Metals, Alcohol and Tobacco, Lead.	Alcohol and Tobacco. Lead, arsenic, carbon-bisulphide, iodoform, quinin, wood alcohol, nitro and dinitro-benzol, cannabis indica. Uncertain vision. Reduced central vision. Central Scotoma for Red.	do. do. do. do. do.
Disseminated Sclerosis. Acute Myelitis.	do. do.	

DIFFERENTIAL SYMPTOMATOLOGY.

Acute Retrobulbar Neuritis.	Chronic Retrobulbar Neuritis.	Toxic Amblyopia.
Vision. Rapid loss. Loss may be partial or complete (1 week).	Gradual loss. Central Scotoma for Red and Green—Relative or absolute.	
Pain. In orbital region and on pressure and movement of the eye.	Not present.	Not present.
External appearance. Unchanged. Ophthalmoscopic examination.	Unchanged.	Unchanged. do.
Hyperemia of nerve head and hazy disc margins. Constricted arteries and distended veins.	Nothing abnormal in earlier stage. Later temporal side of disc is pale.	Rel. Cent. Scotoma Later.
Central Scotoma, early course. Vision may return to normal or remain much impaired.	Central Scotoma Later, Diminution of field and scotoma may persist.	Diminution of field and scotoma may or may not persist.
Papillo-Macular Bundle of fibers in early stage are involved—may involve entire field.	Papillo-Macular Bundle of fibers involved later stages.	do. do. do.

Dr. Crossley stated that sudden changes in vision characterize acute attacks. These attacks may take place within a few days to the extent that all perception of light is absent. A dull pain in the orbital region is a characteristic symptom, and pressure on the eyeball or any movement of the eye by the patient tends to aggravate the symptom. Acute attacks are more commonly unilateral and may come from direct attacks of infection, as in the orbital infections, possibly from some of the acute infectious diseases.

The vision fails gradually in the chronic form of retrobulbar neuritis and varies from a slight disturbance to an entire loss of central acuity according to the scotoma. As a rule, there is more disturbance for color than for form, therefore, the characteristic scotoma for red and green. In later stages of the disease the scotoma which was at first relative, becomes absolute and increases, involving the peripheral field. In the central scotoma the red and green colors are the first to disappear. In most cases the central portion of the field is affected or that part supplied by the papillo-macular bundle of nerve fibers, although in an occasional case complete blindness may develop. A retrobulbar neuritis is an early symptom of disseminated sclerosis.

The treatment of these cases is the treatment of the disease causing the neuritis, and the withdrawal and elimination of the toxin producing it.

DISCUSSION.—Dr. Nance stated that every ophthalmologist came in contact with cases of retrobulbar neuritis of obscure origin. Dr. Crossley had mentioned some 20 diseases that might be responsible for retrobulbar neuritis. The speaker desired to mention one case that came under his observation within the last six months, and he hoped that at some future meeting of the Society he would be able to report it in detail. The patient was a man, 53 years old, a newspaper writer of national reputation, who, after attending a baseball game the latter part of October, noticed the next morning that his vision was very much reduced.

This reduction in vision increased from that time until the following morning when he was absolutely blind in both eyes.

Ophthalmoscopic examination showed the media perfectly clear. Three days later neuritis developed in one of the eyes; there was quite marked swelling of one of the discs which, within two or three weeks, became very pale and there was distinct atrophy.

For a period of ten days the patient was absolutely blind. There was no perception of light. At the end of about the tenth or eleventh day a little vision returned, and about a week or ten days later he was able to read; he had about 15/200 in the eye in which there had been no ophthalmoscopic changes. In the eye showing atrophy vision was afterwards fingers about three or four feet.

The man gave absolutely no history of any of the poisons that were usually looked for as productive of this condition. The Wassermann test was absolutely negative. The tuberculin test was negative. The patient had a number of healthy children, all of good habits; and the only cause that the speaker could attribute the trouble to was the possible one of so-called autointoxication. Following this ball game the patient and two or three of his friends went to a restaurant in a down town district and ate a large steak two or three inches thick, with some boiled cabbage, drank two or three glasses of beer, and really made a hearty dinner. Whether this had anything to do with the production of an acute systemic condition like this he did not know.

Patient was under observation for three weeks a part of the time in the hospital, where he was examined by Dr. E. B. Hutchinson, Dr. Archibald Church, Dr. Kanavel and one or two other observers. Shortly after this the patient left the city and had been visiting with his son in Kansas City. As soon as the patient returned to the city again, he would try and get his field of vision and present the history of the entire case to the Society.

Dr. Oliver Tydings said that Dr. Crossley in his citation of causes left

out one of the most important, namely, next to syphilis in the production of retrobulbar neuritis was tubercular conditions. The diagnosis in some cases of retrobulbar neuritis is exceedingly difficult. In one of the first cases that came under his observation the cause was tubercular. The patient was a woman whom he saw when engaged in general practice. He operated on her for hemorrhoids, and in the course of this work he was requested to make a vaginal examination to see what was in the pelvis, as undoubtedly there was some disease located there. The woman was almost exsanguinated from the loss of blood from the bleeding hemorrhoids. He advised operation later.

He did not see any more of this woman for some years. The next time he saw her he had abandoned general practice and was going east to see his father who had been taken ill. He advised the woman to consult a surgeon. This she did, was operated on, and the report from the surgeon was that she had a tubercular right tube and ovary. Three or four years later the patient came under the speaker's observation with retrobulbar neuritis of tubercular origin, she had recovered under tuberculin therapy. He had not seen the patient since, but he sent her to a local oculist, she was treated by him, and made a good recovery under the use of tuberculin.

With regard to the Wassermann test, he was somewhat skeptical. He cited cases which destroyed his confidence in the Wassermann test. He recalled a case (which was also seen by Dr. Faith) of retrobulbar neuritis associated with other ocular conditions, in which he in consultation with another was advised to remove the eye, the consultant believing the condition to be malignant. There was a swollen disc. The test for tuberculosis gave a reaction of one and a half degrees. The patient was put on tuberculin, got well under it, and has better than 20/30 vision in the affected eye.

Dr. Michael Goldenburg regretted that Dr. Faith was unable to show his case; because he was undecided from the description whether it was one of

retrobulbar neuritis, toxic amblyopia or postneuritic atrophy. The speaker's conception of retrobulbar neuritis was that there were no ophthalmoscopic findings early, but later one could note paleness of the disc at the lower outer quadrant, the region occupied by the papillo-macular bundle. In that event one would get a central scotoma for red and green, if due to alcohol or tobacco or in disseminated sclerosis. There was hardly ever or never congestion or tortuosities of the blood vessels in retrobulbar neuritis or toxic amblyopia.

One could have disturbances of the color field in neuro-retinitis if vision was bad enough, because red and green were the first colors to be lost so that central scotoma for red and green was possible. If it was toxic amblyopia, it was purely a parenchymatous degeneration. If it was a neuritis luetica it was interstitial. In interstitial neuritis antiluetic treatment would be of extreme value. In toxic amblyopia, degeneration of the parenchyma of the nerve fibers, there would be little or no improvement under antiluetic medication. If it was a toxic amblyopia on top of a luetic neuritis, the treatment for lues was indicated.

The treatment for toxic amblyopia was essentially abstinence from the use of tobacco and alcohol. Injections of strychnia in conjunction with nuxvomica per orum were of doubtful value. He had seen many cases get well without the local treatment. A combined condition was not uncommon. An individual, who was susceptible to excesses of alcohol and tobacco, was susceptible also to disease resulting from immorality. True cases of toxic amblyopia have a facies that is characteristic. The eyeball was not normal externally; the sclera was yellowish; the conjunctiva was yellowish, congested and appeared rough. A low grade inflammation was present in the conjunctival vessels, and by lifting the conjunctiva one would find the deeper vessels of the sclera somewhat injected.

Treatment advocated for primary optic atrophy of late was so extensive and varied, and in such a state of chaos

at the present time, that one hardly knows what to do or say. Fuchs definitely states that primary optic atrophy usually grew worse under antiluetic treatment, yet it was resorted to right along.

Dr. Faith, in closing, stated that if toxic amblyopia was kept up for any length of time the patient would have retrobulbar neuritis, and if retrobulbar neuritis was kept up long enough there would be a secondary atrophy; it would not be the gray atrophy such as one would see in tabes. The very earliest thing to appear in some cases of general paresis of syphilitic origin was a retrobulbar neuritis. The question arose, did the retrobulbar neuritis begin by poisoning the neuro-macular bundle by the toxins of syphilis, or did it begin as a neuritis? So far as looking at the eye and examining the fundus was concerned, he did not believe any one could tell the difference except that retrobulbar neuritis was followed eventually by pallor of the whole disc, if the retrobulbar neuritis went on. If one was able to arrest the process, it would end there.

In the treatment, if the toxic substance or substances were not removed, whatever they were, one could not hope to bring about a cure.

MAJOR H. WORTHINGTON,
Secretary.

COLORADO OPHTHALMOLOGICAL SOCIETY.

February 16, 1918.

DR. H. R. STILWILL, Presiding.

Results Following Pterygium Operation.

DR. C. E. WALKER presented Prof. C. O. H., upon whom he had performed a pterygium operation at the outer and inner limbus of each eye. V. O. D. 20/20 with + 2.50 sph. \ominus + .75 D. Cyl. Ax. 20°. V. O. S. 20/20 with + 2.50 D. sph.

Dr. Walker operated by shaving the pterygium from the cornea and undermining the pterygium so as to push it back toward the canthus as far as possible. He then undermined the conjunctiva above and below and made a

short vertical incision in the conjunctiva adjoining the limbus above and below. Three sutures were placed in the conjunctiva to bring the horizontal edges, made separate by the removal of the pterygium, together. He put in another stitch so as to bring the conjunctiva over the retracted tip of the pterygium. This produced atrophy of the pterygium and kept it from growing back over the cornea.

DISCUSSION.—Dr. Melville Black emphasized the importance of removing all of the pterygium from the cornea in each case we operate upon. He said he always shaves the tip of the pterygium off the cornea and includes some of the corneal tissue in this if necessary. He believed too many surgeons leave some of the tissue on the cornea and do not get the results they would otherwise obtain.

Dr. G. F. Libby said that several years ago he did an operation similar to the one described by Dr. Walker. By divulsion he cleaned off the pterygium by using a modified squint hook for this purpose.

Dr. W. H. Crisp stated that the pterygium extends into the substantia propria of the cornea, so that we can't remove all of this without producing a scar. He feels that it is impossible to have a perfectly clear cornea after any pterygium operation.

Dr. J. A. McCaw said that he had seen a number of Dr. Black's cases following the pterygium operation, and it was impossible to detect any scar of the cornea.

Dr. C. E. Walker, in closing the discussion, referred to a case of opaque cornea, after a pterygium operation, and said, so far as he knew, all cases have some corneal opacity; altho he believed we should make every effort, as Dr. Black suggested, to reduce this to the minimum.

Ophthalmia Nodosa.

DR. J. A. MCCAW presented Mr. A. F., age 28. When he was seven years of age, a caterpillar was thrown into his left eye by a playmate. The eye became inflamed and very painful. Two days later a physician removed

some of the hairs. The eye was not used for seven months. At the end of this time the patient said he had light perception only. For a year and a half the eye was quiet, when all of the former symptoms returned. The doctor attempted to remove more hairs. The eye was sore for three months at that time. He had the third attack one year later. The eye remained quiet until he was 12 years old, or three years. At that time his attack was the worst of all, lasting a year. Two years later he had another which lasted 5 weeks, and in two years another which lasted two months. After a period of quiet for three years he had a severe attack, then another in 4 years, and then the last one. During these attacks he had all the symptoms of an iritis. Wassermann was negative.

DISCUSSION.—Dr. Edward Jackson said the diagnosis of ophthalmia nodosa seemed probable even after 20 years; altho one naturally thought of the possibility of some other etiology. In this case the posterior synechia was broad, and it looked as if one of the lesions, with a caterpillar hair in it, was situated in the synechia. Reis, in at least one case, has excised a nodule and demonstrated a caterpillar hair in the nodule. He further stated that the corneal haze, in this patient, was deep in the corneal tissue.

Dr. Melville Black stated that an iridectomy may be of advantage. He would excise the posterior synechia, as it will break loose in this way rather readily, and this might relieve future attacks, especially if there were a nodule in the posterior synechia containing a caterpillar hair.

Dr. W. H. Crisp mentioned the fact that caterpillar hairs have barbs or beards upon them, so they are apt to change their position from time to time and this was a source of irritation to the delicate tissues of the eye. He believed, under such circumstances, that any irritation of the eye, from general conditions throughout the body, can more easily produce inflammation of the eye than if such an eye were free from caterpillar hairs.

Postoperative Congenital Ptosis.

Dr. D. H. COOVER presented Mr. C. M., age 21, following an operation, by the Tansley-Hunt method, for congenital ptosis of O. S. Twelve years ago this patient, a ranchman, was kicked by a horse over O. S., which produced a complete ptosis. Since that time he has been unable to raise the lid. The eye turned in about 5 mm. owing to the loss of power in the external rectus. The outward movement extended to the median line; the movement upward and downward was very slight. Vision nil; lens cataractous, and dislocated backwards into the vitreous. The commissure was very narrow.

Since the operation the lid has remained up; the palpebral opening was almost equal to that of the right eye; and, the eye can be closed equally as well as the other one. Ten days after the Tansley-Hunt operation he tenotomized the internal rectus and advanced the capsule of the external rectus, with the conjunctiva, which corrected the squint. The patient had an excursion outward as well as inward, and some movement of the eye up and down.

DISCUSSION.—Dr. Melville Black said we should dissect off all the skin from the pedicle used in doing the Tansley-Hunt operation. Thru some oversight this was not emphasized in Wood's Encyclopedia of Ophthalmology. Rather recently he had had the pleasure of seeing two cases operated by Dr. A. E. Davis, of New York City, and he incised entirely thru the upper lid in doing an operation for congenital ptosis, and excised completely the semilunar area in the upper lid, the size of which was determined by the amount of ptosis to be corrected. The edges were then sutured with black silk. Dr. Davis has obtained good results by this operation.

Dr. C. E. Walker stated that we should use the frontalis muscle if we expect to get the best results in any case of congenital ptosis. He also favored excising a section of the orbicularis muscle. If necessary he lets the operation for excision of the orbicularis muscle heal; and then forms a

pedicle and sutures it in place, as he can sometimes get a better result by doing this as two operations instead of one.

Result Following Extraction of Steel from Vitreous.

DR. W. C. BANE presented Mr. C. A. C., age 27, boiler maker. On January 3rd, 1918, a fellow workman struck an expander with a hammer and a chip of metal struck O. D. On January 4th, the vision was "hand as object at one foot." There was an oblique cut in the lower nasal quadrant of the cornea 4 mm. in length and a rent in the margin of the iris. The lens capsule was broken and the lens partly opaque. The visual field was manifestly good. The test with the sideroscope was negative. The X-ray located the foreign body 15 mm. back of the center of the cornea and 6 mm. above the horizontal meridian. Under local anesthesia the foreign body, a bit of steel 1x4 mm., was removed by the hand magnet, thru an incision into the eyeball at the temporal margin of the superior rectus muscle and 12 mm. back of the cornea. Very little reaction followed the operation. The lens has partly disappeared since the removal of the steel and vision equaled good light perception and projection, with slight circumcorneal injection six weeks subsequent to the injury.

DISCUSSION.—Dr. Melville Black said he didn't believe the lens was being absorbed, even though the light perception, according to Dr. Bane, was better than a month ago. The cataract could not be absorbed without some further operative intervention. He would not stir this eye up, by needling it, as there was some injection. But he would use atropin until the eye has become quiet, and until after all the medical and surgical treatment has been carried to completion.

Dr. C. E. Walker said when a lens has been injured by a foreign body, such a patient should be watched because of the danger of secondary glaucoma. He would seriously consider the extraction of the lens if the tension

tends to become elevated. He would not interfere so long as the patient does well under the former treatment.

Dr. Black said the injured lens will keep up a slow uveitis with diminished tension. This should be avoided if we are to obtain the best results. He was in favor of making a corneal incision, opening the lens capsule, and washing out all of the lens debris, so as to finish this at one time, as soon as the eye will permit.

Corneal Ulcer.

DR. BANE presented Mr. E. A. B., age 26. The left cornea was injured 2 years ago by a bit of steel. An opaque spot, below the center of the cornea, remains. About Jan. 26, 1918, 3 weeks after acute rhinitis, the opaque spot broke down. A leash of vessels from the lower margin of the cornea extended into the ulcer. The ulcer was inclined to spread and was slow to yield to treatment. Finally it was stimulated to heal by applications of 2% yellow oxid of mercury. There was a history of tuberculosis.

DISCUSSION.—Dr. Melville Black said he saw this case, in consultation, the next day after the yellow oxid of mercury ointment had been used; and he thought the cornea was anesthetic, but it proved not to be. The corneal nutrition was good, due to the leash of vessels extending from the limbus to the ulcer.

Superficial Corneal Haze.

DR. BANE presented Mr. P. J. O'M., age 27, fireman. On February 9th, 1918, he developed a shallow marginal ulcer on the upper nasal quadrant of the left cornea. V. O. S. 20/40. From day to day there has been a change in the broken epithelial layer as it stains with fluorescein. There has been very little irritation of the eye. The interest has centered in the changes in the corneal epithelium. The conjunctiva has not been healthy.

DISCUSSION.—Dr. F. R. Spencer stated that this was a case of epithelial dystrophy, as the haze was very superficial and took the stain so as to demonstrate that only the corneal epithelium was involved.

Scleral Tuberculosis.

DR. H. R. STILWILL presented a woman, age 52, mother of ten children, with the following history: Last April O. S. became red and painful, with diminished vision and photophobia. The corneal opacity has remained since. She was treated by a general practitioner, and no further record of the case has been obtained. V. O. S. 1/60. A few vessels were present and one pin point deposit, probably of calcium, showed in the cornea. Six weeks ago O. D. became inflamed. There was a scleritis entirely around the limbus. The cornea was hazy and the iris muddy. There were posterior synechia, with a slight exudation in the pupillary area. The tension was approximately -1.5, but the eye was not tender.

DISCUSSION.—Dr. J. A. Patterson said this inflammation must be due to some general disease. He was impressed by the diminished tension of each eye. He would seriously consider tuberculosis, and treat it as such.

Dr. H. R. Stilwill said this was rather a typical sclerosing keratitis, as described by Fuchs, and that Fuchs gave as causes congenital lues, tuberculosis, rheumatism, etc.

Dr. C. E. Walker said he had had a lady patient, age 23, with an attack of scleritis with posterior synechia. Tuberculosis was the only cause found. Later the other eye had iritis with focal points in the choroid. Under tuberculin, the inflammation entirely disappeared. He thought it advisable to do an iridectomy when the eye has become quiet.

Dr. W. H. Crisp said from the general appearance he thought this was very suggestive of tuberculosis. There was a small round cell infiltration, and it was probably not a case due to focal infection. He believed that we should not consider the clinical picture so much. We should not make our diagnosis based upon the clinical picture, but rather upon the etiology.

Drs. Patterson and Black each emphasized the importance of the administration of tuberculin, at least, for diagnostic purposes.

Uveal Tuberculosis.

DR. MELVILLE BLACK made a subsequent report upon a case of uveal tuberculosis, shown at the January meeting. See March No., p. 341. Two days after the January meeting, the tension was greatly elevated. The atropin was stopped and eserine used. The pupil remained dilated, however. He used a subconjunctival injection of sodium citrat, but this was followed by an intense reaction. He wanted to do iridectomy, but knew this would be very difficult under the condition the eye was in. The high frequency current was used, for 30 minutes, but to no advantage in lowering the tension.

Dr. Edward Jackson saw this patient in consultation and advised an iridectomy. This was duly performed and the incision was made with a keratome.

Immediately the anterior chamber completely filled with blood, and it was impossible to see the iris. The forceps were used three times in an attempt to draw the iris out through the wound, but each time the attempt was unsuccessful. The blood clotted promptly and was so thick it could not be washed out of the anterior chamber. Finally, with the fourth attempt, Dr. Black succeeded in removing a piece of the iris as he happened to be, this time, assisted by Dr. J. N. Foster who suggested placing the forceps at a little greater angle. The next day the tension was elevated as before. Enucleation was seriously considered by the patient's husband, a physician, and Dr. Black. On the second day after the operation, however, the tension was reduced. The blood in the anterior chamber had been partly absorbed and the iris was found to be present in the wound at two points. However, this may be an advantage in aiding drainage.

DISCUSSION.—Dr. C. E. Walker said it was very difficult to do an iridectomy in such a case. We should use the small cataract knife of Lamb's, and he did not approve of the keratome.

Dr. Black said posterior sclerotomy is often a failure, because of the massive vitreous hemorrhage which defeats our purpose.

FRANK R. SPENCER, Secretary.

WILLS HOSPITAL OPHTHALMIC SOCIETY.

Meeting of April 2, 1918.

Permanent Hemianopsia Following Migraine.

DR. WILLIAM CAMPBELL POSEY gave the notes of a series of cases in which permanent quadrant and hemianopic lesions followed so-called migrainous attacks.

Case 1.—Mrs. H., age 40. Two years prior to consulting the writer after a rather prolonged strain upon her eyes at near work, and while she was suffering from intestinal toxemia, she suddenly lost one-half of her visual field. As far as can be ascertained, the outer half of the right field of vision was at first destroyed. But after a few days, peripheral field cleared, and the loss was limited to a small section at the fixation point in each eye; so that when she read she could see but the first half of words, and experienced great difficulty in seeing any small objects upon her dressing table.

This interesting case has been at various times under the care of competent ophthalmologists and internists, but despite all the eliminating measures which have been undertaken, the central loss in her field of vision remains unaltered. Her error in refraction consists of a low grade of hyperopic astigmatism, and with proper glasses vision is normal in each eye. Her extraocular muscle balance is also normal. The eye-grounds are negative. Her fields of vision show no limitation in the peripheral field, but definite hemianopic defects at fixation in each eye, the scotomatous areas extending from fixation to the right.

The patient has always had a poor digestion and for years has been under care for intestinal toxemia. Prior to the attack which resulted in the permanent loss of vision, she had repeatedly suffered from migrainous seizures, always associated with head pain. Scintillations of light accompanied some attacks, in others hemianopic blindness was the only symptom present. At times the blind areas would be on the right side, at times on the left. As far

as she could remember, tho there had been repeated attacks of sick headache, there had been no visual obscurations since the permanent areas of hemianopic blindness manifested themselves.

Case 2.—Mrs. E., age 46. Subject to migraine for many years. Following an unusually severe attack, there had persisted a right lateral homonymous defect in the upper quadrant of the fields of vision in each eye.

Case 3.—Mrs. B., age 33. Right homonymous hemianopsia with preservation of a small area in extreme periphery of the right field followed by a severe attack of pain in the left side of the head, and accompanied by loss of sensation and motion in the right arm and leg. Sensation returned in the paralyzed side about two hours after the attack and motion some time later, but the visual defect persisted.

Dr. Posey referred to a number of other cases which he had found in the literature on this subject and to which he had referred in a paper before the Section on Ophthalmology of the Baltimore City Medical Society in 1915.

Dr. Posey said that there is ample evidence in the literature to the effect that migraine may be the inciting cause of organic brain disease, and that an area of softening of the brain may follow, which may manifest itself by a permanent paralysis, aphasia or hemianopsia. While such lesions usually occur in individuals who are predisposed in consequence of disease of the walls of the blood vessels, it would seem that in certain cases the vascular lesions may occur in young persons and even in some adults with healthy vessels. Caution, however, must be observed in ascribing even an exciting role to migraine in cases of organic brain disease, as it is not unlikely that independent disease of the blood vessels is responsible for the resultant symptoms, and the migraine merely coincident.

As bearing upon Case 1, Dr. Posey gave the notes of another case already reported by him, in which right homonymous hemianopsia, which was confined to the macular regions, followed an apoplectic seizure in an

arthritic male 50 years of age. He recalled that this defect in the visual fields in association with cerebral disease was first called attention to by Mills, in 1898; and that Wilbrand, in 1907, reported eight cases observed by him and gave a detailed analysis of the condition. This latter author is of the opinion that the scotomas under consideration appear when an end artery in or near the cortical center of the visual area becomes occluded, and believes that the calcarine artery is the vessel chiefly involved.

Dr. Posey also gave the notes of a case of recurrent oculo-motor palsy, or ophthalmoplegic migraine (Charcot), which had recently been under his care. This unusual affection of the central system occurred in a girl 13 years of age, the first attack with implication of the eye muscles occurring when she was but 6 years old. According to the statement of the mother, the first attack was attended with severe head pain, following which the left eyelid drooped and the patient complained of double vision. The left eye also deviated outwards. There had been five recurrences of these symptoms, the paralysis in each instance passing away in from 10 to 14 days. No unusual visual phenomena attended any of these attacks. Her general health has been poor and an examination of her blood revealed marked chlorosis.

Dr. Posey referred to a second case reported by him and Dr. Spiller in 1905, namely, that of a physician 31 years of age, who presented almost complete ptosis of his right upper eyelid and a paretic condition of the inferior oblique and the internal rectus muscle of the same eye. His ocular symptoms dated from 14 years of age, when the patient began to suffer from spells of dimness of vision, associated with flashes of light upon the side, and followed by headache and nausea. These seizures apparently were typical attacks of migraine. They occurred upon both sides of the head and were brought on by gastric disturbances, overuse of the eyes, and general fatigue. At the end of two years the character of the attacks changed as the spectra disap-

peared, tho the pain in the head and the gastric symptoms still persisted. While in attendance at the medical school, the pain in the head was almost constantly present, especially over the right eye, which led him, as mentioned above, to seek relief from glasses. His health is otherwise good.

Ten months before he came under the observation of the speaker, after continuous professional work of more than usual severity, following an attack of pain in the right eye which had persisted for a few days, he saw double for the first time. He is unable to say whether the attacks of migraine had been more aggravated just prior to the attack of diplopia than usual, but he is confident of the preceding pain in the eye without the migrainous symptoms. At the time of the attack the double vision was more marked when he looked to the left and above, but there was no ptosis. This diplopia persisted several weeks and then gradually passed away, leaving no apparent ocular disturbance, his eyes giving him no further trouble until July, when a return of the double images was again remarked. The double images were of much the same character as in the preceding attack, but there was the additional symptom of the drooping of the upper lid of the right eye. At first the ptosis was intermittent, but in the course of a few weeks it became permanent and almost complete, until November 1st, when the lid raised for several days, but dropped again, however, and the eye remained closed until November 24th, when the lid again raised and resumed its natural appearance and so continued one week, when it began to partially droop, in which condition it still remains.

On account of the unusual course of the palsy, the attack of diplopia six months previous to the onset of the present palsy being also occasioned in all probability, as judged by the position of the double images, by an involvement of the right oculomotor nerve, it was thought best to ascertain whether there existed any further involvement of the nervous system. The patient was accordingly examined by one of

us (Dr. Spiller), who found that he closed his eyelids well, drew up the corners of his mouth fairly well together, but not very well separately. The tongue was protruded straight, was moved freely, and showed no fibrillary tremors. The masseter contracted well on both sides. Sensation for touch and pain was normal in the two sides of the face.

He had no weakness of the limbs. The patellar reflexes were prompt but not excessive, and the right was a little prompter than the left. The Achilles jerks were prompt but not excessive, and he did not have ankle clonus. Sensation for touch and pain was normal in the hands and feet. The gait and station were normal with the eyes open or closed. He had possibly an area of slight hypalgesia on each side of the thorax about the nipple line; this, however, was not positive, and tactile sensation here was normal.

The patient when questioned gave further information regarding the attacks that he had had when he was about fifteen years of age and later. In these he would become completely blind, and would not recognize an object across the room, although he could see light faintly. These attacks lasted about half an hour, and were followed by severe headache. During the blindness he saw flashes of light. The blindness disappeared before the headache developed. He had not had any of these attacks during the past ten years.

Dr. Posey referred at some length to the literature on the subject of oculomotor palsy and said that Möbius assumes that the lesion is at the base of the brain and combats Charcot's opinion that the periodic oculomotor palsy is a form of migraine (migraine ophthalmoplegique), and he believes the migraine is only symptomatic, as it may be in epilepsy or in parietic dementia. Migraine may cause oculomotor palsy, but in periodic oculomotor palsy the lesion causes the palsy and the migraine is an aura. How migraine may cause the palsy is unknown. In most cases of periodic oculomotor palsy the paralysis occurs in the first attack.

In the cases in which a necropsy has

been obtained, basal hemorrhagic pachymeningitis was found in one case, a tubercle, a fibrochondroma, and a neurofibroma in others. Oppenheim thinks that the periodic oculomotor palsy is related to migraine, as Charcot believed, and dependent upon vasomotor disturbance. Spasm of the vessels obstructs the blood supply and causes the paralysis, or overfilling of the vessels compresses the nerve. Attacks may occur without permanently injuring the nerve, but finally degeneration and inflammatory changes occur in the nerve and the paralysis persists. Such vascular disturbances may cause exudative processes or tumor. The symptoms may be progressive, or may be arrested, or may disappear.

In the report of the case cited, Dr. Spiller pointed out that some very important distinctions will be noticed between the descriptions of Möbius and Oppenheim. A lesion may readily cause a paralysis of only certain branches of the oculomotor nerve, even though it be a tumor at the base, and a partial palsy should not be sufficient reason for exclusion of a cause. Dr. Spiller also said that one must always remember that a recurrent oculomotor palsy may be the first sign of a general organic disease of the nervous system, like tabes or multiple sclerosis, but in the case reported no sign of such disease could be found.

DISCUSSION.—Dr. Zentmayer said that among other phenomena of ophthalmic migraine are the phosphenes and other sensory irritation symptoms, such as the so-called fortification spectra. Also the presence, in the blind area of the field, of visual hallucinations. He believed that Dr. Posey himself had once reported a case in which the patient saw a bull's-eye in the hemianopic blind field.

A rare field defect noted by Dr. Zentmayer in a man 45 years of age, who had been subject to migraine since childhood, was a temporary ring scotoma in both fields. Later the defect became hemianopsic in one eye, but retained its half-ring form. The patient died from pneumonia about a year subsequent to these observations.

Epithelial Dystrophy of Cornea.

DR. WM. ZENTMAYER presented a case of Epithelial Dystrophy of the Cornea. The patient, who was seen at Wills Hospital, was a woman 65 years of age. Her vision had been slowly failing for about one year. There was no history of inflammation nor was she engaged in any occupation irritating to the eyes. Her general health was excellent. Vision, O. D. 15/30, O. S. 15/200.

In each cornea there is an ovoid area measuring 6 by 8 mm., in which the

corneal epithelium is cloudy and presents in places dart-like elevations, which catch the light in oblique illumination and look almost crystalline. The cloudiness is due to pin-point opacities. The small elevations are probably due to changes in Bowman's membrane. The cornea is not anesthetic. The fundus is normal. In the skin of the lids there are patches of xanthelasma. The Wassermann is negative. The von Pirquet is strongly positive.

HAROLD W. HOW, Secretary.

SHORT ABSTRACTS.

Marin.—Papilledema and Lumbar Puncture.—(La Clinique Ophthalmologique, July, 1917.)

The majority of authors give the etiologic factors of choked disk in the following order of frequency: Tumors, syphilis, tuberculosis, hydrocephalus, hemorrhages, and abscesses. However the author has in his experience found tuberculous meningitis the most frequent cause, followed by hydrocephalus, tumors, etc.

He reports three cases in detail which show the beneficial results of many lumbar punctures in the tuberculous variety of meningitis, performing this operation fifteen times in one case. He feels that the favorable action is due not only to the elimination of the toxins (Leber's theory); but also to the increasing of the intracranial circulation which gives more nutrition, and is the principal defense against the infection.

Lumbar puncture is a much simpler procedure than trephining and callosal puncture, and if it proves insufficient the more radical procedures may then be instituted. The amount of fluid removed depends upon the age of the patient and the decrease in the swelling of the disk, the latter being the best guide. Generally 20-30 cc. will suffice in adults. The only medication used with benefit has been small but frequent doses of mercury which possess a tonic stimulating action in tubercu-

losis lesions especially when the visual apparatus has been attacked.

J. S. W.

Cabaut, J. A.—Two Cases of Filaria Loa.—(Boletín de la Sociedad de Ophthalmología de Buenos Aires, v. 4, p. 33.)

This paper gives a report of two cases, in the first of which the author was able to remove the parasite which was moving freely under the skin of the inferior lid by means of a threaded needle passed through the skin around the vermes and tied quickly, in order to capture it. A small incision on the skin allowed a forceps to catch and pull the parasite, which came out intact. It was six centimeters long by half millimeter wide. Under the microscope it proved to be a *Filaria Loa*.

Another parasite was removed some days afterward from under the conjunctiva of the same eye. As it moved very quickly, Cabaut was only able to catch it with a forceps through the conjunctiva. In making the incision the vermes was cut in two parts and only the caudal end extracted.

Examination of the blood of this patient during day time showed great quantities of embryos surrounded by a sheath. Marked eosinophilia.

In the second patient the parasite was also seen under the conjunctiva and the same method of extraction employed with partial success, due to the swiftness of the vermes.

Only six other cases are reported in the ophthalmologic literature of Argentina; all in patients that, as those of Cabaut, have lived in Congo, Sudan or other places in Africa, where it is very common.

U. T.

Maxwell, Euphan M. and Kiep, Walter H.—Iritis and Cyclitis Occurring in Dysenteric Patients.—(Brit. Jour. Ophth., Feb., 1918.) The writers observed six cases of iritis or cyclitis in patients infected with *B. dysenteriae*; all of these occurred in the Mediterranean region, and in four of them there was arthritis. The histories of these patients are given in full and there are added the following conclusions: (1)

Patients suffering from an infection by *B. dysenteriae* (Shiga) may occasionally develop anterior uveitis as a result of this infection, as pointed out by Morax. (2) This ocular affection may, or may not, be accompanied by articular manifestations. (3) The ocular affections would appear to occur most frequently about one month after the first signs of involvement of the bowel, but may occur as early as the twelfth day. (4) The articulo-ocular syndrome corresponds exactly to that occurring in another affection of a mucous tract, viz., gonorrhea, as pointed out by Garrod.

C. H. M.

American Journal of Ophthalmology

Series 3, Vol. 1, No. 6.

June, 1918

PUBLISHED MONTHLY BY THE OPHTHALMIC PUBLISHING COMPANY

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EYE LESIONS OF INFECTIVE JAUNDICE.

The scientific designation "Spirochetosis Ictero-hemorrhagica," proposed for this disease, is so long and cumbersome that in view of the uncertainty of the proper name to be applied to the causative organism we are still justified in using the older names of "Febrile or Infective Jaundice" or "Weil's Disease." It had long been encountered and referred to in medical literature as febrile, infective or epidemic jaundice, before Weil in 1886 described it as a distinct pathologic entity. Even after that it was classed with such varied conditions as typhus, typhoid fever, acute yellow atrophy of the liver, malaria, poisoning by putrid meat, yellow fever and amebic dysentery.

Altho supposed to be infectious its etiology was unknown, the guess of the cause most referred to being some form of proteus. Since Weil's description of it, sporadic cases and endemics of it have been reported from many parts of the world. Osler refers to an endemic in Egypt, fatal in ten per cent of the cases, but generally it is less

dangerous. It was recognized in various districts in Japan, and studied by a group of Japanese investigators with important scientific and practical results. In February, 1915, Inada and Ito announced that the cause is a spirochete. The proof of causation by this organism is now complete, it has been transmitted to lower animals especially guinea pigs and rats. The organism has been grown in pure culture, its injection has produced the disease in the guinea pig, and the guinea pig inoculated experimentally has accidentally transmitted the disease to man.

Whether the organism should be called a spirochete or whether it should be regarded as belonging to a distinct genus, for which Noguchi suggests the name *Lepidospira*, will have to be settled by especial students of microbiology. Examined alive, with dark ground illumination, it is seen to move very rapidly even thru semi-solid media. This power will account for its ability to invade the sound skin of the guinea pig, even in a few minutes.

Like the *spirocheta pallida*, it makes its way to all parts of the body; but unlike that organism provokes an ade-

quate protective reaction, which makes the disease self-limited. By the end of 30 to 40 days the invader has been expelled from the body, and the symptoms that arise later, are the after effects of the invasion that has passed. Apparently the rat is the carrier. Infected rats have been found in the mines of Japan, the trenches of Belgium and France, the cities and rural districts of Southern England, and among the mountains of Tennessee. So far no intermediary host has been found, and it is possible for the organism to live days outside the body.

As pointed out by Weekers and Firket (see January Journal, p. 50) the chief eye symptoms do not arise during the more acute febrile stage, except a general ocular hyperemia noticed especially in the conjunctiva in a large majority of cases. But the disease is liable to be unrecognized until jaundice sets in at about the fifth day. The jaundice, which is often slight and may be absent, is most noticeable over the sclera and has been noted on the optic disk. The evidence of more serious ocular lesions arises with the second febrile reaction about ten days to two weeks after the first general symptoms. Such lesions are likely to be subacute or chronic in form, but they tend to ultimate recovery, generally complete.

The general tendency to disorganization of the blood and hemorrhage is manifest in subconjunctival ecchymoses. Retinal hemorrhage should also be looked for. But the most common and serious ocular lesions are those involving the uveal tract. These are reported in from 10 to 15 per cent of all severe cases; and may bring the patient under the observation of the oculist after general convalescence has been fairly established. The pupils may dilate slowly and irregularly under atropin, and not at all to cocain; altho little other evidence of iritis is present. Few synechiae are formed, but slight opacities of the vitreous are common.

Neuro-retinitis, optic neuritis and retrobulbar neuritis occur in an important proportion of cases, and muscae are much complained of. Following exper-

imental intraocular injections, Hertel observed corneal lesions in which he found the organisms, as well as in the conjunctiva, uveal tract, retina, and optic nerve. Before the discovery of the spirochete Koshichi had observed exudates and small hemorrhages in practically all parts of the eye, except the lens; with the changes most marked in the ciliary body and neighboring vitreous. Excessive lacrimation and photophobia have also been associated with trigeminal neuralgia in some cases.

Such studies as have already been made regarding this disease, beside revealing on the clinical side a new condition in which the ocular lesions are of practical importance, throw new light on the pathology of diseases due to invasion by this class of organisms.

E. J.

THE AMERICAN OPHTHALMOLOGICAL SOCIETY.

This is an organization that should be better known to the ophthalmologists of America. It is the oldest association in America devoted to a special branch of medicine; and with probably one exception the oldest society of the kind in the world. It has a restricted membership, but ophthalmologists of good professional standing have always been welcome to attend its meetings; and many of them have availed themselves of this opportunity and have been invited to take part in its discussions.

Its Transactions should be familiar to all English reading ophthalmologists. They can be obtained of the Secretary, Dr. Sweet, for a subscription price less than that which they actually cost the members; for after they are once in type additional copies cost but little. Many of the most valuable papers on ophthalmic subjects that have appeared in the last fifty years have been published in these transactions. Upon them were largely founded the scientific reputations of Agnew, Noyes, Bull, Norris, Thomson, Harlan, Williams, Wadsworth, and Derby. Their successors are just as active and scientific, and continue a series of oph-

thalmic contributions of which any country might well be proud.

The meeting this year at New London, July 9 and 10, will be in a way an evidence of patriotism. Some of the most active and prominent members of the Society have entered the Government services; and it remains for others to close up the ranks and carry on its scientific campaign. It is a real service to sustain thru this time of war every valuable institution of our country in peace. This war is being fought for the future, and every valuable activity of peace that can be sustained unimpaired will add to the significance and value of victory. Every member of this society can do something to support the group of active workers in the Surgeon General's Office who have made the Ophthalmological division of the medical profession, the best organized body of professional men that have come to the support of the American Government in its struggle to keep the earth free for democracy and civilization.

OUR JOURNAL FORM.

In an undertaking so largely mutual and cooperative as the publication of this journal, the reasons for its policy should be understood by all concerned. So much of the eye-work of the community is concerned with the printed page, that it is especially important that every oculist should do some definite thinking about the mechanical presentation of reading matter. These considerations justify devoting a little space to this subject.

In the first place the paper used should be permanent. Journal files become the largest and most important part of every medical library. Ophthalmology is relatively a new branch of medicine, at least in the development of a special literature, but already the files of its special journals are assuming great importance. It was worth while to use in our journal a paper made from good stock. Such paper is more expensive in America than anywhere else. The price on the amount needed for the printing of this journal

each month, has increased about forty dollars since the beginning of the year. Such an increase has caused the British Journal of Ophthalmology to decrease its size from 64 to 48 pages. Even this is not too great a sacrifice to make for good paper.

The surface of the paper used for such a journal has to be something of a compromise. The modern half-tone reproduction of photographs is most successful on a very smooth "highly-finished" surface. For the printing of text and diagrams a rougher surface serves better and does not give the regular reflection of light which is always annoying to the eyes. To get the very best result with half-tones we have to resort to the very smooth paper used for plates. But even for the body of the journal a paper rather highly finished has to be employed, since many half-tones need to be printed with the text.

The color chosen accords with the fact, established by scientific observation and general experience, that for black letters, white with a faint tint of color from near the center of the spectrum is the best back-ground. The cream tinted paper is better than that which approaches either blue or red. For the same reason the color of the cover has been selected. The black lettering appears more distinct against the yellow, than against a back-ground of any other decided color.

There are equally good reasons for using the double column page. At the ordinary reading distance a length of line of four inches or over requires too wide a lateral excursion of the eyes in reading it, for the greatest ease and comfort. This may be illustrated by reading the lines of the headings for the departments of News Items or of Ophthalmic Literature, and comparing these with the matter set in the same type but in double column beneath. The double column page gives the advantage of the shorter line with less blank paper; and yet affords the large page when needed for tables or illustrations.

There has been complaint as to the binding of the journal, and some reason for it. But the tendency of the

paper back to loosen and come off is connected with the way in which the sheets composing the journal are stitched. If this journal is opened its pages lie comparatively flat. Because they do so it is possible for the reader's eyes to avoid regular reflection from the smooth paper. Many journals of similar form never open flat; but show a roll of each page near where they join. Along such a roll there is always a band of regular reflection that the reader cannot escape. The form of stitching the sheets here used is more expensive, and the opening to lie flat puts a strain on the glue of the back that is never put on the back of

the journal stitched through with wire. But the difficulty with the back is being lessened; and the gain of avoiding a band of light reflex from the page is worth more than what is gained from the other form of stitching.

The form of this journal presents no novelty. It is the form which has gradually been evolved and adopted by modern literary journals of the highest class. There has been a reason for each step in this evolution; and these reasons should be known and appreciated by the ophthalmologist. The ocular hygiene of many patients requires attention to such details.

E. J.

BOOK NOTICES.

AMERICAN ENCYCLOPEDIA AND DICTIONARY OF OPHTHALMOLOGY, Volume 12, edited by Casey A. Wood, assisted by a large staff of Collaborators. Pages 8905 to 9647. Cleveland Press, Chicago, 1918.

This book, we may suppose, is known to nearly all our readers. But this first notice of it in our new Journal may dwell a little on the general character of such a work. The encyclopedia in its modern development is best illustrated by the Eleventh edition of the Britannica. It is characterized by the bringing together matter related to every part of the subject with which it deals, and mention of all closely related knowledge; the division of its matter under a great number of topical headings and the arrangement of these topics alphabetically. It is a form of work almost unknown in medical literature. The bulk of so-called encyclopedias of medicine or surgery lack topical division and alphabetic arrangement. They are simply aggregations of lengthy monographs, expanded systematic text-books; or, if alphabetically arranged the topics are so briefly considered that they must be classed as dictionaries rather than encyclopedias. There is no work with which this one

can be compared. Its nearest predecessors are the Manuel d'Oculistique ou Dictionnaire Ophthalmologique, of M. Wenzel, 824 pages, 1800; and the uncompleted Encyclopedie der Augenheilkunde of O. Schwarz, 848 pages (1902-1909). The other books such as Norris and Oliver or the Graefe Saemisch that might be thought of in this connection are simply collections of monographs with no attempt at topical division or alphabetic arrangement; and cover a much narrower range of knowledge.

The alphabetic arrangement of topics is what gives the encyclopedia its value as a work of reference. The system or monograph does well enough for the systematic study of its subject; but it is quite inferior as a work of reference when the busy ophthalmologist has to look up a particular point regarding some case he has to deal with or some subject that is engaging his thought. This is not merely a theoretic distinction. In an office well supplied with modern ophthalmic literature, The American Encyclopedia of Ophthalmology, still incomplete, is more often consulted than all the "systems," etc., put together. This work when completed will be truly a working library in itself.

The present volume carries the work from Ophthalmology Literature of, page 8905, to Phonopticon Crystal, page 9647. The longer articles it includes are those on Orbit, by James Moores Ball; Orbit Injuries of, H. V. Wurdemann; and Orbit Operations on the, and Tumors of, apparently by the Editor, making 85 pages on the general subject of the orbit. Ophthalmoscope and Ophthalmoscopy, also by the Editor, take up 110 pages, and Perimetry, by Howard McL. Morton, 184 pages. But perhaps the information that it would be practically impossible to find in any other work, and which constitutes an extremely valuable contribution to the science of ophthalmology is that contained in the section on Parasites, ocular, 95 pages, by Henry B. Ward, Prof. of Zoology in the University of Illinois. For its valuable original articles, as well as for its systematic arrangement of the matter it presents, the early completion of this work is greatly to be desired. E. J.

GLAUCOMA, A TEXTBOOK FOR THE STUDENT OF OPHTHALMOLOGY, by Robert Henry Elliot, M. D., B. S., London, Sc. D. Edin. F. R. C. S., Eng. Lt. Col. I. M. S. (Retired). Pages 662. With 158 Illustrations. H. K. Lewis and Co., Ltd., 136 Gower St., London, W. C. 1918. Paul B. Hoeber, New York.

In these 532 pages of text, Col. Elliot has gathered the prevailing views as to that *symptom complex* called by us "glaucoma," has assorted them and eliminated, after due study of the vast literature, all of those which do not agree with his designation of the condition; which is a result of a number of lesions and which is best described in English as "elevation of the intraocular pressure." To this conception of the diseased condition has been fitted practically all forms of surgical intervention that have stood the test of time. In fact the only successful procedures have been those which resulted in a filtering scar.

The Author collates his subject under Anatomy and History, Intraocular Pressure and Tension, Etiology, Diagnosis Secondary and Congenital Glaucoma,

The Medical Treatment, Iridectomy and The Newer Operations including Sclerotomy, Lagrange and others up to Sclero-Corneal Trephining.

The Author's operation with the preliminary and after treatment is given the preference. Chapter X is given to the discussion of the filtering scar.

An appendix describes a New Scotometer and an Extension of Seidel's sign, which is a characteristic wing-like extension of the normal blind spot found in glaucoma.

Although this is the latest word on the subject of scleral-corneal trephining yet it will not be the last by any means. For tho most of us have accepted the procedure as the best form of operation, and in this category may be included the reviewer; yet there are those quoted in the book as doing this operation who have recently more or less given it up, going to the Lagrange operation or even back to iridectomy, on account of untoward results happening in their experience.

It may be permitted for the reviewer to remark that Lieut. Col. Elliot's personal experience of what must be now 2,000 operations without primary or secondary infections; and the results achieved by others who have followed the Author's technic of thick conjunctival flaps, indicate that this technic would have prevented these ills and would result in the practically universal acceptance of the procedure. H. V. W.

THE STEREOSCOPE IN OPHTHALMOLOGY. David W. Wells, Professor of Ophthalmology, Boston University Medical School. 12mo. 152 pages, 31 illustrations. Boston: Globe Optical Company. 1918.

The subtitle of this book states that it is, "with especial reference to the treatment of heterophoria and heterotropia, designed to accompany the Phoro-Optometer Stereoscope and the Wells Selection of Stereoscopic Charts." It illustrates the value of concentration of effort upon a limited subject in the production of a book that shall be of practical value. Few books that come to our notice are so well adapted to accomplish their object. The author indicates what he has

hoped to do by quoting from a reader of the first edition as follows: "I have been able to master your system of muscle training to the point of having gotten some very good results, with no other instructor than the book itself."

The use of the stereoscope in the treatment of heterophoria and heterotropia is alluded to in every treatise on these conditions, but it is a therapeutic measure that has been more alluded to than understood or practised. It is to be hoped that with clear, concise instructions as to methods of procedure this will be changed in the future; and this important method becomes truly available among the resources of most of those engaged in ophthalmic practice. If fusion training were more generally and more intelligently resorted to by ophthalmologists, its value would be recognized by the laity; and cases of muscular imbalance would come to treatment earlier as it became better understood that the treatment of squint was not wholly by glasses and operation.

This work, however, is somewhat broader than its title might imply. One chapter, one-tenth of the book, is devoted to "Musculo-Capsular Advancement—the Author's Modification of Worth Technic." It is a chapter that can be read with interest and profit even by the surgeon whose interest in squint has been merely operative. When read in connection with its context, a broader view even of mere operative technic becomes unavoidable.

The large clear type and general excellence of execution as well as its direct clear sentences make this a book that will be read with comfort as well as profit.

E. J.

TESTS FOR COLOR BLINDNESS. By Prof. Dr. Shinobu Ishihara, Major I. J. A. M. C., Tokyo, Handaya, Hongo Harukicho, 1917. (Second Notice.)

This series of sixteen plates is intended to quickly and accurately discover congenital color blindness and is in use for testing railway employees, candidates for the navy and others. The illustrations are in the form of 9 cm., cir-

cular areas, made up of a collection of still smaller dots varying in size from 1 to 5 mm. The latter are formed of various pinkish, purplish, bluish and greenish confusion of colors. The objects to be discerned are numerals about 5 cm. in height, composed of confusion colors in this background of dots and of lines which may be traced from their beginning by the examinee, the latter being used for the illiterate.

The reviewer has had some use of the charts and has really been amused by the results of the examination in the color blind. The use of the Snellen red and green glasses for malingerers gives this new book or rather "test cards" a most prominent place, for certainly this supplements the Snellen Test in a most effective manner.

We especially call the attention of the Army and Navy Examiners to this series of Charts.

H. V. W.

INTERNATIONAL CLINICS. Series twenty-eight. Vol. 1. Edited by H. R. M. Landis, M. D. Philadelphia. 8vo. 308 pages. Illustrated. Philadelphia and London. J. B. Lippincott Company. 1918.

The ophthalmologist devoting himself to special practice needs to keep in touch with the most important advancements in general medicine. A practical way of doing this is through this series of quarterly volumes of illustrated clinical lectures and original articles, edited with the collaboration of such eminent men as Sir Wm. Osler, Frank Billings, Charles H. Mayo, Rupert Blue, and their colleagues.

In this volume the departments represented in addition to the clinics are Medicine, Neurology, Public Health, and Surgery. There is also given the General Review of Medicine for the year 1917. Of especial interest to the Ophthalmologist are the lectures on "Injuries to Cranium and Brain in Warfare," by Charles Greene Cumston; "The Secondary Suture of Infected Wounds," by Dr. W. Estell Lee; and the "Treatment of Shell and Gunshot Wounds," by Henri Bigo.

The "Treatment of Non-Pulmonary

Tuberculosis," by Dr. John B. Hawes, and the "Therapeutic Use of Occupation" will be of some interest; and in the general review of medicine for 1917 is found brief reference to the important literature of "Infective Jaundice," a condition that we now know to be of ophthalmologic importance. E. J.

Luckiesh in the development of the daylight unit.

LUTHER C. PETER.
Philadelphia, Pa.

CORRESPONDENCE.

Daylight Screens.

To the Editor: In my article on "Artificial Daylight Illumination," which appeared in the March number of the AMERICAN JOURNAL OF OPHTHALMOLOGY, the statement was made inadvertently, that "all daylight screens are manufactured by the Corning Glass works." In this I was misinformed, as I find that other firms and notably the National Lamp Works of Nela Park, Cleveland, have daylight units on the market. The medical profession gives a cordial welcome to any device which will aid in the conservation of vision, and the writer is deeply indebted to the Nela Research Laboratory for calling his attention to their screen, and to the work of Dr. M.

Technic of Credé Method.

To the Editor: May I suggest that the controversy between Drs. Allport and Shastid over the Ophthalmia Neonatorum Law gives undue prominence to the remedies and not enough to the technic of application? Credé showed many years ago, in an extended tabulation, (see old files of this journal), that the *contact drop* from the glass rod was safe and the medicine dropper unsafe; but it is more than doubtful that this is known to the average accoucheur. Such may be listening (or reading), and he should not be led astray by a discussion on remedies. For many years I have preached the Credé gospel to my colleagues and the nurses in the training school, with emphasis on the technic and a demonstration of it. The law should not name the remedy without proper directions for its application.

H. B. YOUNG.
Burlington, Iowa.

NEWS ITEMS

Personals and items of interest should be sent to Dr. Melville Black, 424 Metropolitan Building, Denver, Colorado. As these columns go to press on the 30th of the month contributors should send in their items by the 25th. The following gentlemen have consented to supply the News Item Editor with the news from their respective sections: Dr. H. A. Beaudoux, St. Paul; Dr. James A. Black, San Francisco; Dr. V. A. Chapman, Milwaukee; Dr. A. E. Davis, New York City; Dr. Robert Fagin, Memphis; Dr. M. Feingold, New Orleans; Dr. Wm. F. Hardy, St. Louis; Dr. George F. Keiper, La Fayette, Indiana; Dr. George H. Kress, Los Angeles; Dr. W. Holbrook Lowell, Boston; Dr. G. Oram Ring, Philadelphia; Dr. Chas. P. Small, Chicago; Dr. George M. Waldeck, Detroit; Dr. Oscar Wilkinson, Washington. It is desirable that this staff shall be enlarged until every city of importance in the United States shall be covered as well as all foreign countries. Volunteers are therefore needed and it is hoped that they will respond promptly to this call.

DEATHS.

Dr. C. von Sicherer, University of Munich, died recently.

Dr. John Chase, aged 62, of Denver, died May 3rd, 1918, after a protracted illness.

Dr. I. S. L. Bermann, of Washington, D. C., died April 6th, from angina pectoris.

Lieut. Hugh Tate Moore, M. R. C., U. S. Army, Wilmington, N. C., aged 31, died at Camp Kearney, San Diego, California, April 8th from mercuric chlorid poisoning, the drug being taken by mistake for calomel.

CORRECTIONS.

In the "Honor List" published in the May issue were included only the names of those in active service in the Army. Those connected with other branches of the service, as the Navy, were not mentioned. Although compiled from official sources it included only those on active duty at a certain date. The names of the following ophthalmologists and probably others were omitted:

Capt. George W. Woodnick, Chicago.
Adj. Sidney Walker, Jr., Chicago.
Lieut. C. P. Small, Chicago.

Capt. Herbert Walker, Chicago.
 Capt. C. A. Bahn, New Orleans.
 Major Burton Chance, Philadelphia.
 Capt. Louis Levy, Memphis, Tenn.
 Capt. John R. Newcomb, Indianapolis, Ind.
 Capt. Maurice Krebs, Huntington, Ind.
 Capt. Edward Willis, Indianapolis, Ind.
 Capt. M. M. Clapper, LaFayette, Ind.

PERSONALS.

Dr. John A. Donovan, of Butte, Montana, who has been ill with pneumonia, is now convalescent.

Dr. Austin A. Hayden, of Chicago, has been for some time confined to St. Joseph's Hospital, suffering from inflammatory rheumatism.

Dr. Nelson M. Black, and Dr. Vernon Chapman, announce their permanent association under the firm name of Drs. Black and Chapman, Suite 1213 Wells Building, Milwaukee, Wisconsin.

Dr. Joseph B. Cowherd has resigned as physician in charge of the eye, ear, nose and throat work of the Kansas City school hygiene staff, and has been succeeded by Dr. Thos. T. Sawyer.

Dr. Willis O. Nance, of Chicago, has been re-elected for his fifth term as a member of the city council. He is the only physician in the council, and has done most efficient work as chairman of the committee on public health.

Dr. C. R. Dufour, of Washington, D. C., has resigned as Clinical Professor of Ophthalmology and Otology at the Georgetown University Medical School and Hospital, and has been made Emeritus Professor of those specialties.

COMING MEETINGS.

American Ophthalmological Society, Eastern Point, New London, Conn., July 9-10.

Oxford Ophthalmological Congress, Oxford, England, July 10-12.

American Academy of Ophthalmology, and Oto-Laryngology, with the Fourth Colorado Ophthalmological Congress, Denver, Colorado, August 5, 6, 7.

Pacific Coast Oto-Ophthalmological Society, Salt Lake City, August 12-13.

SOCIETIES.

Dr. Richmond McKinney was elected President of the Tennessee Medical Association at its recent meeting at Memphis. Dr. McKinney was Chairman of the eye, ear, nose and throat section at this meeting.

There were about forty specialists present at the recent State meeting in Memphis. Very interesting clinics were given at the Memphis General Hospital. Dr. Fagin had charge of the eye clinic, which consisted of fifteen operative cases and many interesting external and fundus cases. Dr. McKinney had charge of the ear, nose and throat clinics.

At the annual meeting of the State Medical Society held in Springfield, Ill., on May 21-23, the Ophthalmological Section was unusually

well represented. The following Chicago ophthalmologists presented papers: W. O. Nance, J. C. Beck, R. J. Tivnen, F. Allport, G. W. Boot, C. P. Small, T. Faith, H. R. Boettcher, J. R. Hoffman, H. L. Pollock, E. F. Garraghan, H. H. Roth, M. Goldenburg, and E. R. Crossley. Dr. Wesley H. Peck was elected President of the Section for the ensuing year.

MILITARY NOTES.

Capt. Wm. A. Sedwick, of Denver, stationed at Camp Grant, has been spending a ten-day furlough at home.

Dr. I. A. Lederman is a member of the Medical Advisory Board, District Number 11, in charge of the eye and ear department, in Louisville.

Capt. John R. Newcomb, M. R. C. of Indianapolis, Ind., has left for Washington, and has been assigned for temporary duty with the attending surgeon's office in Washington.

Dr. Edgar M. Marbourg of Colorado Springs, Colo., recently received a commission as captain in the M. R. C., and has been ordered to report for duty at Camp Pike, Ark.

Dr. M. L. Foster, of New Rochelle, N. Y., and of the editorial staff of the New York Medical Journal, has been called to Ft. McHenry, Md., and assigned to active duty in the Army General Hospital.

Major H. B. Hitz, M. R. C., Oto-Laryngologist to the Milwaukee Base Hospital Unit, left May 19th. This unit is a well equipped one-thousand bed hospital and has been mobilized and under intensive training for several months at Milwaukee.

Dr. Charles D. Blassingame, of Memphis, Tenn., who has been with the firm of Drs. Hill, Simpson and Fagin, now has charge of eye work at the Government Hospital at Fort Screvens. He has recently been made captain.

Drs. George E. de Schweinitz, of Philadelphia; Casey A. Wood, of Chicago, and Nelson M. Balck, of Milwaukee, working in the office of the Surgeon-General, have been promoted to the rank of Lieut.-Colonel in the National Army.

Lieut. John J. Shea and Lieut. J. B. Stanford, of Memphis, Tenn., who were connected with the Aviation School at Memphis, are now at Ft. Oglethorpe. They have been assigned to Major Frank D. Smythe's Hospital Unit, and expect to sail for France soon.

Lieut. Wm. Brown Doherty, M. R. C., formerly an interne in the N. Y. Eye and Ear Infirmary, and more recently associated with Dr. J. M. Ray in Louisville, Ky., went to France in January attached to Hospital Train No. 20, and is now connected with a base hospital in Paris.

Of the following Boston ophthalmologists, Major Allen Greenwood is on government duty in France; Major Alexander Quackenboss is on duty at the base hospital at Camp Wheeler, Macon, Georgia; Capt. A. Gardiner Morse is on duty at the Base Hospital at Camp

Grant, Rockford, Illinois; and Capt. John G. Jennings is on duty at Ellington Field, Houston, Texas.

Dr. Walter R. Parker, of Detroit, who for the past year has been on duty in the Surgeon-General's office in Washington, has been promoted to the rank of Colonel. Dr. Parker entered the army service a year ago in the Medical Reserve Corps and was later made a lieutenant-colonel in the National Army.

Of the Detroit oculists, Capt. George Frothingham, who has been in charge of the Aviation examinations in Detroit for the past year, has been transferred to Mineola, L. I. Capt. Robert Beattie has been called into active service, and is now stationed at Ft. Sherman, Chillicothe, Ohio. Capt. Byron H. Jenny has been stationed at Camp Bowie, Ft. Worth, Texas. First Lieut. Frank C. Ryerson is now stationed at Selfridge Field, Mt. Clemens, Mich. First Lieut. Raymond S. Goux has been assigned to Hazelhurst Field, L. I.

Major Charles Franklin Adams, M. R. C., is chief of the Eye, Ear and Nose Section in the Base Hospital at Camp Greene, Charlotte, N. C.

MISCELLANEOUS.

A special course of training in ophthalmic treatment and nursing will be given at the New York Ophthalmic Hospital to fit students for war service.

The National Committee for the Prevention of Blindness is raising a special fund of \$20,000 to provide shelter and treatment for those blinded in the Halifax disaster.

It is pertinent at this time to warn all those in military service against the wearing of spectacle frames and eye-glass frames made of any inflammable material. It might be disastrous in the presence of fire, explosions, etc., to which active service may expose the wearer.

The University of Guatemala was founded April 30th, 1918, and is named the "Estrada Cabrera" and is modeled after the best universities of the United States. The Medical School will be one of its parts. Dr. Pacheco Luna will be at the head of the Department of Ophthalmology.

The National Committee for the Prevention of Blindness has issued its report for the year 1917. In the thirty-one state schools for the blind in the U. S., 8,961 pupils were blind from ophthalmia neonatorum. In addition there were 375 in the public schools. A total, therefore, of 9,336 pupils blind from this disease. The Committee estimates that there are 15,000 people in the U. S. today who are blind from industrial accidents.

At a meeting of twenty-four optical manufacturers, held in New York City, May 15th, it was resolved to organize a War Service Committee to represent the entire optical industry. This committee will assemble accurate information with respect to the facilities of the industry, act with the War Industries Board to establish principles governing the distribution of materials in transportation, and advise the departments of the Government with regard to questions affecting the industry.

OPHTHALMIC LITERATURE.

Under this head continuing the "Index of Ophthalmology" heretofore published in *Ophthalmic Literature* will be found the subjects of all published papers received during the last month, that bear to an important extent upon ophthalmology. The subject is indicated rather than the exact title given by the author. Where the original title has been in a foreign language it is translated into English. The journal in which the paper is published will indicate the language of the original.

The names of the different journals are indicated by abbreviations which generally correspond to those used by the *Index Medicus*, the *Journal of the American Medical Association*, and the *British Journal of Ophthalmology*. We will from time to time publish the list of ophthalmic journals, with the abbreviations used for each. Often a single letter discriminates between journals published in different languages. Thus "Arch. of Ophth." refers to the *Archives of Ophthalmology*, published in English; "Arch. d'Opht." indicates the French *Archives d'Ophthalmologie*; "Arch. de Oftal." refers to the *Archivos de Oftalmologia Hispano-Americanos*, while "Arch. di Ottal." indicates the Italian *Archivio di Ottalmologia*.

In this index of the literature the different subjects are grouped under appropriate heads; so that all papers bearing on the same, or closely related subjects, will be found in one group. The succession of the groups is the same from month to month, and identical with that of the *Digest of the Literature*. Where a paper clearly refers to two subjects that belong in different groups, it will be noticed in both groups.

Each reference begins with the name of the author in heavyface type. This is followed by the subject of his paper. Then in brackets a number with (ill.) indicates the number of illustrations, or a number with (pl.) the number of plates illustrating the article, (col. pl.) indicates colored plates. (Abst.) shows that it is an abstract of the original article. (Bibl.) tells that the paper is accompanied by an important bibliography. (Dis.) means that the paper was read before some society and gave rise to a discussion which is published with it.

The "repeated titles" may render accessible the essential part of a paper, the original of which could not be consulted. These give (in brackets) after the author's name the volume and page of this department of "Ophthalmic Literature" where the title of the paper will be found; and then the journal, volume, and page where the translation or abstract is published.

It is desired to notice every paper as soon as possible after it is published. Readers will confer a favor by sending titles they notice have been omitted, with journal and page of publication; and of their own papers, sending either a copy of the journal in which each appeared, or a reprint. These should be sent as soon as possible to 318 Majestic Building, Denver, Colorado.

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